

Service Manual



# Service Manual

## LG-S310



Model : LG-S310

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# 1. INTRODUCTION

## 1.1 Purpose

This manual provides the information necessary to repair, calibration, description and download the features of the LG-S310.

## 1.2 Regulatory Information

### A. Security

Toll fraud, the unauthorized use of telecommunications system by an unauthorized part (for example, persons other than your company's employees, agents, subcontractors, or person working on your company's behalf) can result in substantial additional charges for your telecommunications services. System users are responsible for the security of own system.

There might be risks of toll fraud associated with your telecommunications system. System users are responsible for programming and configuring the equipment to prevent unauthorized use. LGE does not warrant that this product is immune from the above case but will prevent unauthorized use of common carrier telecommunication service of facilities accessed through or connected to it. LGE will not be responsible for any charges that result from such unauthorized use.

### B. Incidence of Harm

If a telephone company determines that the equipment provided to customer is faulty and possibly causing harm or interruption in service to the telephone network, it should disconnect telephone service until repair can be done. A telephone company may temporarily disconnect service as long as repair is not done.

### C. Changes in Service

A local telephone company may make changes in its communications facilities or procedure. If these changes could reasonably be expected to affect the use of the LG-S310 or compatibility with the net work, the telephone company is required to give advanced written notice to the user, allowing the user to take appropriate steps to maintain telephone service.

### D. Maintenance Limitations

Maintenance limitations on the LG-S310 must be performed only by the LGE or its authorized agent. The user may not make any changes and/or repairs except as specifically noted in this manual. Therefore, note that unauthorized alternations or repair may affect the regulatory status of the system and may void any remaining warranty.

# 1. INTRODUCTION

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## E. Notice of Radiated Emissions

This model complies with rules regarding radiation and radio frequency emission as defined by local regulatory agencies. In accordance with these agencies, you may be required to provide information such as the following to the end user.

## F. Pictures

The pictures in this manual are for illustrative purposes only; your actual hardware may look slightly different.

## G. Interference and Attenuation

LG-S310 may interfere with sensitive laboratory equipment, medical equipment, etc. Interference from unsuppressed engines or electric motors may cause problems.

## H. Electrostatic Sensitive Devices

### ATTENTION

Boards, which contain Electrostatic Sensitive Device (ESD), are indicated by the  sign. Following information is ESD handling:

- Service personnel should ground themselves by using a wrist strap when exchange system boards.
- When repairs are made to a system board, they should spread the floor with anti-static mat which is also grounded.
- Use a suitable, grounded soldering iron.
- Keep sensitive parts in these protective packages until these are used.
- When returning system boards or parts like EEPROM to the factory, use the protective package as described.

### 1.3 ABBREVIATION

For the purposes of this manual, following abbreviations apply:

◆ <b>APC</b>	Automatic Power Control
◆ <b>BB</b>	Baseband
◆ <b>BER</b>	Bit Error Ratio
◆ <b>CC-CV</b>	Constant Current – Constant Voltage
◆ <b>CLA</b>	Cigar Lighter Adapter
◆ <b>DAC</b>	Digital to Analog Converter
◆ <b>DCS</b>	Digital Communication System
◆ <b>dBm</b>	dB relative to 1 milli-watt
◆ <b>DSP</b>	Digital Signal Processing
◆ <b>EEPROM</b>	Electrical Erasable Programmable Read-Only Memory
◆ <b>EGPRS</b>	Enhanced General Packet Radio Service
◆ <b>EDGE</b>	Enhanced Data rates for GSM Evolution
◆ <b>EL</b>	Electroluminescence
◆ <b>ESD</b>	Electrostatic Discharge
◆ <b>FPCB</b>	Flexible Printed Circuit Board
◆ <b>GMSK</b>	Gaussian Minimum Shift Keying
◆ <b>GPB</b>	General Purpose Interface Bus
◆ <b>GPRS</b>	General Packet Radio Service
◆ <b>GSM</b>	Global System for Mobile Communications
◆ <b>IPUI</b>	International Portable User Identity
◆ <b>IF</b>	Intermediate Frequency
◆ <b>LCD</b>	Liquid Crystal Display
◆ <b>LDO</b>	Low Drop Output
◆ <b>LED</b>	Light Emitting Diode
◆ <b>LGE</b>	LG Electronics
◆ <b>OPLL</b>	Offset Phase Locked Loop
◆ <b>PAM</b>	Power Amplifier Module
◆ <b>PCB</b>	Printed Circuit Board
◆ <b>PGA</b>	Programmable Gain Amplifier

## 1. INTRODUCTION

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◆ PLL	Phase Locked Loop
◆ PSTN	Public Switched Telephone Network
◆ RF	Radio Frequency
◆ RLR	Receiving Loudness Rating
◆ RMS	Root Mean Square
◆ RTC	Real Time Clock
◆ SAW	Surface Acoustic Wave
◆ SIM	Subscriber Identity Module
◆ SLR	Sending Loudness Rating
◆ SRAM	Static Random Access Memory
◆ STMR	Side Tone Masking Rating
◆ TA	Travel Adapter
◆ TDD	Time Division Duplex
◆ TDMA	Time Division Multiple Access
◆ UART	Universal Asynchronous Receiver/Transmitter
◆ VCO	Voltage Controlled Oscillator
◆ VCTCXO	Voltage Control Temperature Compensated Crystal Oscillator
◆ WAP	Wireless Application Protocol
◆ 8PSK	8 Phase Shift Keying

## 2. PERFORMANCE

### 2.1 HW Feature

Model Name	LG-S310 ( Bar )	
Size	Dimensions	114 x 48.4 x 10.5
	Weight (w/ Battery)	86g
Network	EDGE,GSM Quad	850/900/1800/1900
Chip Set	BB(ARM9 208MHz)	MT6235
	RF( Full EDGE)	AD6546
Memory	MCP(Flash / RAM)	1G NAND/512 SDRAM
	Card Slot	microSD, up to 4GB
Display	TYPE	TFT
	Size	2.2 inch 176 x 220(QCIF)
CAMERA	Resolution	3M FF CMOS
	Flash	NA
DATA	Bluetooth	V2.1 with A2DP
	USB	microUSB v2.0
Sound	Receiver	
	Speaker	16 Φ / SPK Phone Support
BATTERY	LGIP-550N	Li-ion 900mAh
	Standby Time	Over 290 hour @Period 5
	Talk Time	Over 3hours@GSM Tx Level 5
FEATURES	FM	Wired + Wireless(w/o india )
	SNS	Facebook,Twitter,China Local
	Messaging	SMS, MMS, E-Mail
	Web Brower	WAP 2.0

## 2.2 RF Spec.

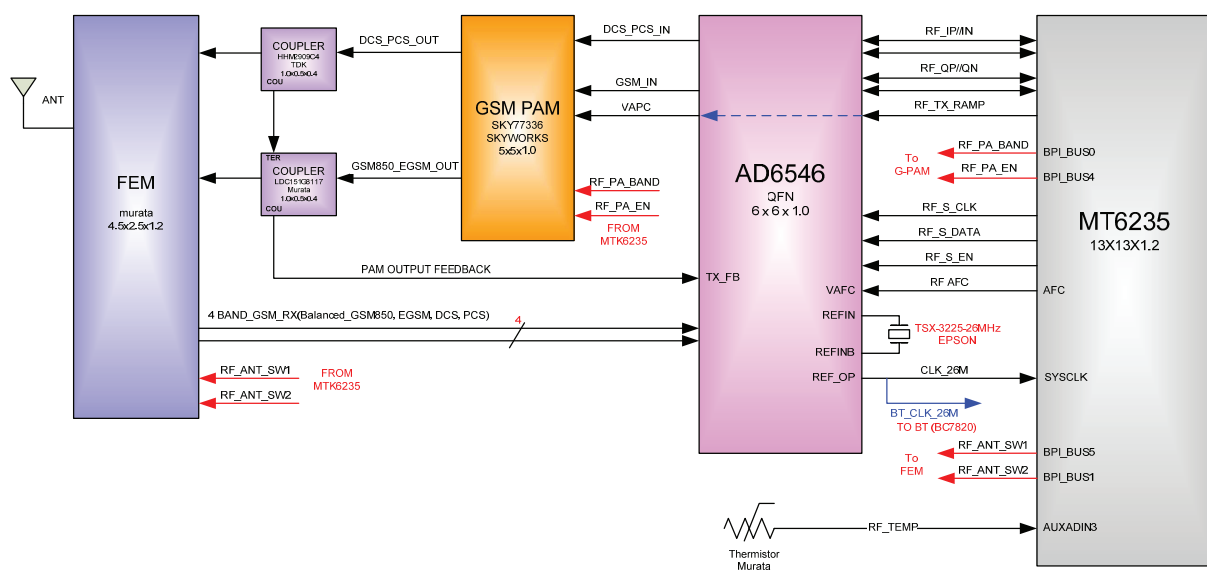
	GSM850	EGSM900	DCS1800	PCS1900
Frequency [MHz]	824-849	880-915	1710-1785	1850-1910
Uplink/Downlink	869-894	925-960	1805-1880	1930-1990
Tx/Rx Spacing	45 MHz	45 MHz	95 MHz	80 MHz
Phase Error	RMS 5°      Peak : 20 °			
Frequency Error	0.1 ppm	0.1ppm	0.1ppm	0.1ppm
EMC	< -28dBm	< -28dBm	< -28dBm	< -28dBm
Transmitter Output Power	5dBm – 33dBm ± 3dB		0dBm – 30dBm ± 3dB	
	5dBm – 33dBm ± 3dB		0dBm – 30dBm ± 3dB	
Transmitter Output Power (EDGE)	5dBm – 26dBm ± 3dB		4dBm – 26dBm ± 3dB	
	5dBm – 26dBm ± 3dB		4dBm – 26dBm ± 3dB	
Burst Timing	<3.69us			
Spectrum due to modulation out to less than 1800kHz offset	200kHz : -36dBm 600kHz : -51dBm/-56dBm			
Spectrum due to modulation out to larger than 1800kHz offset to the edge of the transmit band	GSM : 1800-3000kHz :< -63dBc (-46dBm) 3000kHz-6000kHz : <-65dBc (-46dBm) 6000kHz < : < -71dBc (-46dBm)		DCS : 1800-3000kHz :< -65dBc (-51dBm) 6000kHz < : < -73dBc (-51dBm)	
Spectrum due to switching transient	400kHz : -19dBm/-22dBm(5/0), -23dBm 600kHz : -21dBm/-24dBm(5/0), -26dBm			
Reference Sensitivity – TCH/FS	Class II(RBER) : -105dBm(2.439%)			
Usable receiver input level range	0.012(-15 - -40dBm)			
Intermodulation rejection – Speech channels	± 800kHz, ± 1600kHz : -98dBm/-96dBm (2.439%)			
Timing Advance	± 0.5T			

## 3. TECHNICAL BRIEF

### 3.1 General Description

The LG-S310 supports GSM850, GSM-900, GSM-1800, and GSM-1900 based GSM/GPRS/EDGE.

RF Transceiver(AD6546) is a fully integrated Quad band GSM Transceiver with an advanced modulator design that fully supports 8-PSK EDGE modulation format. The AD6546 contains a translation loop modulator for directly modulating baseband signals onto an integrated Tx VCO.



[Figure 3.1-1] Block Diagram of RF part

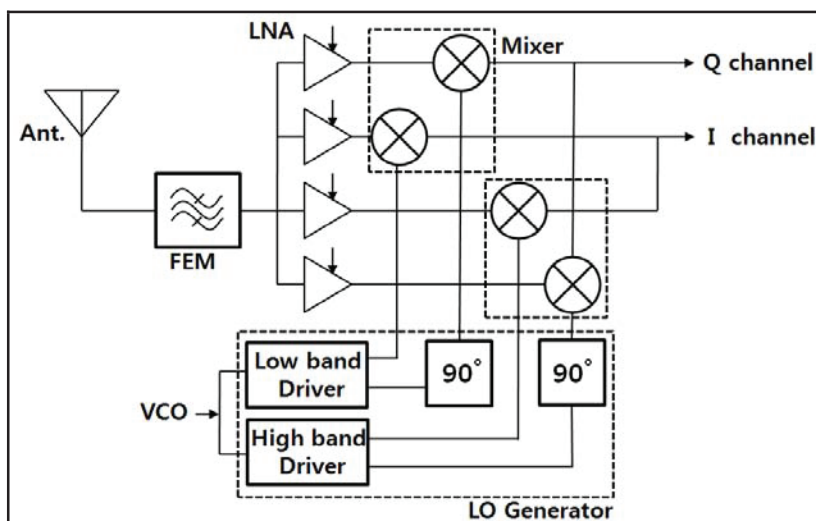
### 3. TECHNICAL BRIEF

The translation loop modulator and Tx VCO are extremely low noise removing the need for external TX filtering. To support EDGE modulation with high PA efficiency the design includes a full polar modulation architecture including PA linearization. To reduce BOM the TX PLL loop filter components are fully integrated. The AD6546 uses the industry proven direct conversion receiver architecture of the Othello™ family. For Quad band applications the front End features four fully integrated differential LNAs with programmable-gain. The RF is downconverted by quadrature mixers and then fed to the baseband programmable-gain amplifiers and active low pass filters for channel selection. The programmable-gain baseband amplifiers and the LNA gain step are set via a standard 3-wire serial bus. The Receiver output pins can be directly connected to the baseband analog processor. The Receive path features automatic calibration and tracking to remove DC offsets. The AD6546 uses a single integrated LO VCO for both receive and the transmit paths. The synthesizer lock times are optimized for EGPRS applications up to and including class 12. The AD6546 contains three on-chip low dropout voltage regulators(LDOs). These maintain the correct supply voltages to the on chip circuits with a wide range of battery voltage input. Comprehensive power down options are included to minimize power consumption in normal use.

## 3.2 GSM Part

### 3.2.1 GSM Receiver

The LG-S310 receiver section fully integrates all the RF and baseband signal processing. Each block is described in the following sections.



[Figure 4.2.1-1] GSM Receiver Path

#### **Low Noise Amplifiers**

The LNAs have differential inputs which help minimize the effect of unwanted interferers. The inputs are easily matched to industry standard FEMs or discrete Rx SAW filters. The outputs of the LNAs are directly coupled to the down-converting mixers. The voltage gain of the LNAs is typically 24 dB. Each LNA can be switch to a low gain mode when receiving large input signals as part of the AGC system.

#### **Down-Converting Mixers**

Two quadrature mixers are used to mix down the signals from the LNAs, one for the high bands (1800 and 1900 MHz) and one for the low bands (850 and 900 MHz). The outputs of the mixers are connected to the baseband section through an integrated single pole filter with nominal cut-off frequency of 800kHz. This acts as a "roofing filter" for the largest blocking signals (i.e. those  $\geq 3\text{MHz}$ ) and prevents the baseband amplifiers from being overloaded.

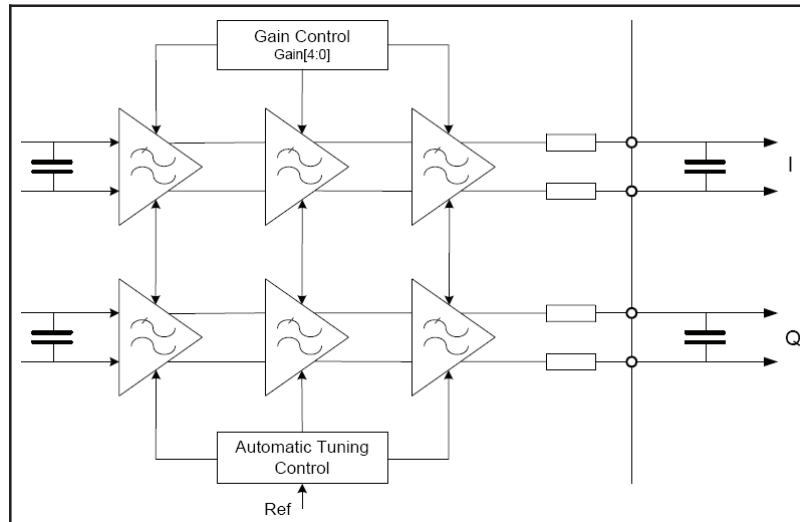
#### **Receive Local Oscillator (LO) Generator**

The LO generator is used to convert the synthesized VCO signal to the on-frequency quadrature LO required by the receiver. By operating the VCO at a frequency other than the desired receive frequencies, any leakage of the VCO (e.g. via package) will fall out of band. The LO generator is implemented as a regenerative frequency divider, performing a  $2/3$  multiplication of the synthesized-LO for the high band (DCS1800/PCS1900) and a  $1/3$  multiplication for low band (GSM900/GSM850).

#### **Baseband Amplifiers / Low Pass Filters**

The baseband amplifiers provide the majority of the analog receiver gain. The filtering is provided by an integrated 5th order Chebyshev filter giving the necessary adjacent channel and blocking filtering, it is also acting as an anti-alias filtering for Baseband Converter ICs. The output stage includes an internal resistance so a final low pass pole can be created with external shut capacitors, if necessary. The on chip filter has an auto calibration feature ensuring that the filters are tuned for optimum performance in both EDGE and GSM modes.

### 3. TECHNICAL BRIEF



[Figure 3.2.1-2] Receiver Baseband Section

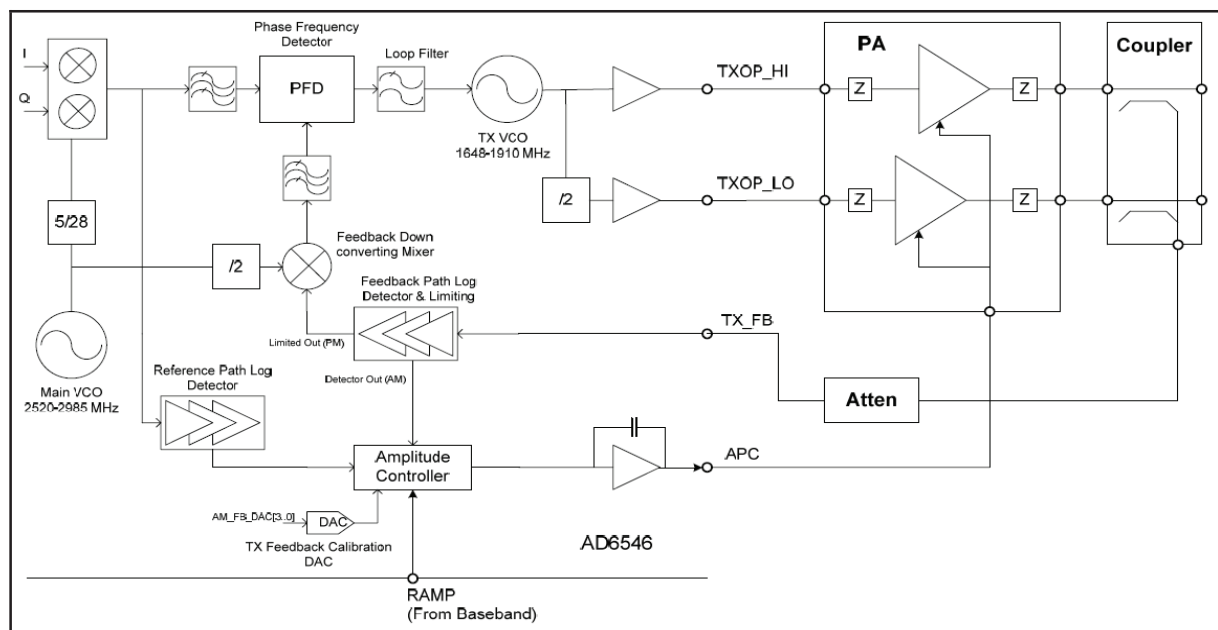
The baseband amplifiers have programmable gain for system AGC. A total of 57 dB of gain control is provided in 3dB steps programmable over the serial interface. This together with the LNA gain control gives a total of 77dB of gain control range. The receive baseband outputs are routed to the common Rx/Tx I/Q ports for connection with the baseband converters.

#### Baseband Output D.C. Offset Correction

In order to minimize DC offsets inherent in the receiver and maximize dynamic range a DC offset correction circuit is integrated. The one-off calibration is triggered over the serial bus upon initialization and then a fully automatic offset tracking loop is enabled to minimize residual offsets during operation.

## 3.2.2 GSM Transmitter

The highly integrated transmit section of the AD6546 radio has been designed to fully support 8 PSK modulation for EDGE applications, and GMSK modulation for GSM. A translational loop is used for phase modulation, and for 8 PSK additional envelope (AM) circuits are enabled to implement a Polar modulator. This provides a high quality & high efficiency GMSK / 8PSK modulation system with a minimum of external components. The Transmit modulator blocks are described in the following sections.



[Figure 3.2.2-1] GSM Transmitter Path

### Quadrature Modulator

The Quadrature modulator takes the baseband I/Q signals and converts this onto a complex modulated signal (containing both amplitude and phase information) at the TX IF frequency. After bandpass filtering the TX IF signal is used as the reference input to the Phase Frequency Detector (PFD) for the transmit PLL, and in EDGE mode also provides the input to the Reference Path Log Detector circuit for AM restoration. The modulator also contains a fully automatic DC offset calibration routine ensuring Origin offset requirements are comfortably met.

### Phase Frequency Detector (PFD)

This ensures that the transmitted signal is accurately locked to the desired frequency with the desired TX phase modulation. The downconverted feedback signal from the PA is phase locked to the reference quadrature modulator output by the PFD charge pump output supplying current to the loop filter. The filter is autocalibrated together with the RX baseband filters to remove any process tolerances.

### 3. TECHNICAL BRIEF

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#### **TX VCO**

The Transmit Voltage Controlled Oscillator (TX VCO) and tank components are a fully integrated subsystem. The subsystem includes PA drivers so the outputs are used to directly drive the external PAs. In Low band operation the TX VCO output is divided by two and filtered.

#### **Feedback Path**

The feedback path is modified from the standard GMSK Translational loop, by inclusion of the Power Amplifier (PA), as shown in Figure 4.2.2-1. This enhancement means the loop corrects for AM to PM distortion that is generated in the PA with non constant-envelope modulation. The feedback signal is coupled from the PA output and applied to a successive detection log/limiting amplifier. The limiting function removes the amplitude information from the feedback and applies the phase information to the translational loop via the feedback down converting mixer. The detector output is used in the AM loop. The feedback down converting mixer is used to translate the amplitude limited feedback signal to the TX IF Frequency. The subsequent integrated band pass filter removes the mixers unwanted side band and higher order mixing products, prior to the PFD input. A Fully integrated TX Sequencer manages phase locking prior to PA ramping.

#### **AM Loop**

The Polar modulator architecture also contains an amplitude loop for control of the PA output power. This allows the AM content of the 8PSK modulation to be efficiently and accurately transmitted by a Polar PA significantly exceeding spectral mask requirements. Non linear and distortion effects created in the PA are automatically corrected by the loop, enabling ease of use in operation and minimal factory calibration.

The Output of the Modulator is fed to a high dynamic range Log Detector. The detector extracts the AM content from the modulator output, which is used as the reference in the AM loop. The feedback path consists of a coupler on the PA output and a high dynamic range matched Log Detector. Both signals are fed to the Amplitude controller block.

The Amplitude controller block takes inputs from both the Reference and Feedback Detectors and from the RAMP input terminal. Using various signal processing techniques an error term is generated which is fed into an integrator. The integrator output voltage is used to drive the PA Power control input pin. To support a variety of PA models the Amplitude Controller gain slope can be programmed via the serial bus. The amplitude controller includes a DAC for precise alignment of the feedback path loop. This is achieved by a onetime simple factory power calibration procedure. Unwanted amplitude variations in the reference path (eg. IQ input level) are removed by a track and hold circuit integrated into the Amplitude Controller block. In GMSK mode the reference detector circuit is powered down, but the RAMP input remains active meaning no external circuitry or switching is required for PA control in ether mode.

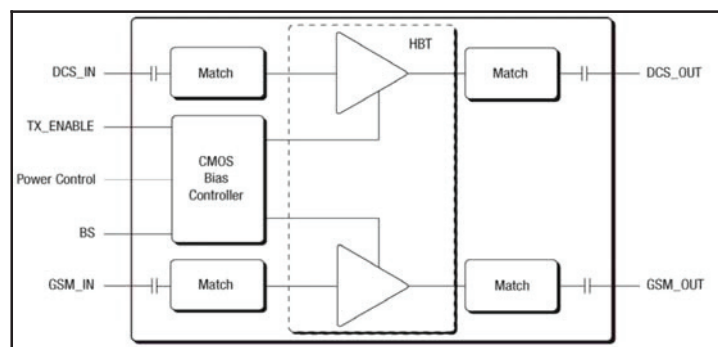
### 3.2.3 Power Amplifier Module(SKY77336)

SKY77336 Power Amplifier Module (PAM) is designed in a compact form factor for quad-band cellular handsets comprising GSM850/900, DCS1800 and PCS1900, supporting Gaussian Minimum-Shift Keying (GMSK) and Polar Enhanced Data for GSM Evolution (EDGE) modulation. Class 12 General Packet Radio Service (GPRS) multi-slot operation is also supported.

The module consists of GSM850/900 PA and DCS1800/PCS1900 PA blocks, impedance matching circuitry for 50  $\Omega$  input and output impedances, and a Power Amplifier Control (PAC) block. The custom CMOS integrated circuit provides the internal PAC function and interface circuitry. Fabricated in InGaP/GaAs, the Heterojunction Bipolar Transistor (HBT) PA blocks support the GSM850/900 bands and DCS1800/PCS1900 bands. Both PA blocks share common power supply pads to distribute current. The InGaP/GaAs die, Silicon (Si) controller die, and passive components are mounted on a multi-layer laminate substrate and the entire assembly is encapsulated with plastic overmold.

RF input and output ports of the SKY77336 are internally matched to a 50  $\Omega$  load to reduce the number of external components for a quad-band design. Extremely low leakage current(10  $\mu$ A, typical) of the PAM module maximizes handset standby time.

The SKY77336 also contains band-select switching circuitry to select GSM (logic 0) or DCS/PCS (logic 1) as determined from the Band Select (BS) signal. See Figure shown below.



[Figure 3.2.3-1] PAM functional Block diagram

### 3. TECHNICAL BRIEF

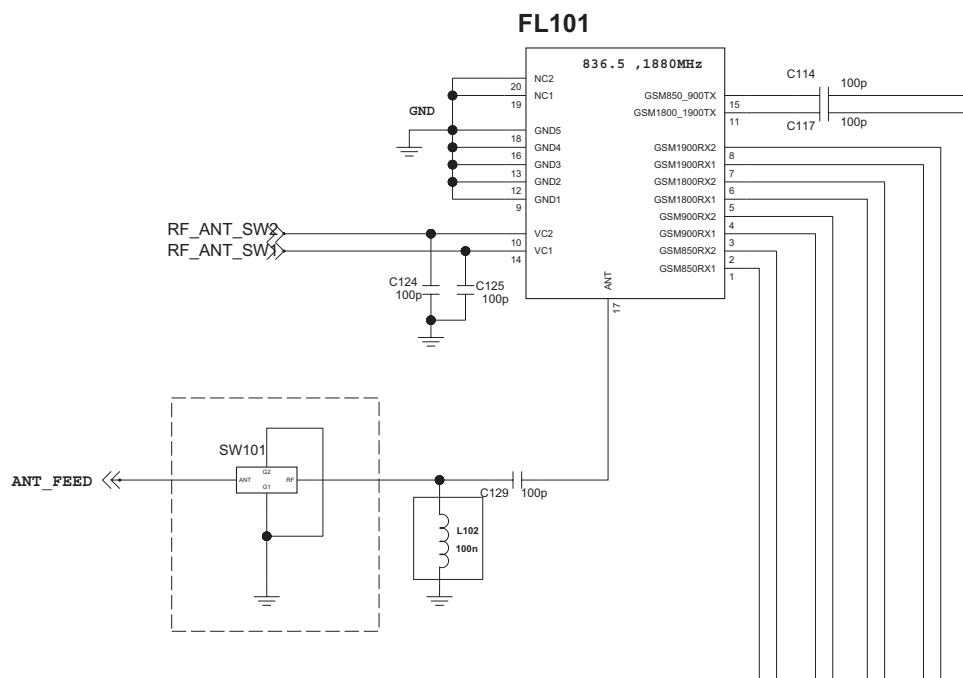
#### 3.2.4 Front End Module(LMSP4DNA-883)

- SAW front end module for mobile telephone systems
- Covering GSM850, GSM900, GSM1800, GSM1900 bands
- Integration of GSM 850, EGSM, DCS, PCS RX SAWs
- Balanced outputs of all RX ports

FEM(FL101) has two logic inputs, which are VC1, VC2, for selecting RX/TX-mode and low/high-band operation

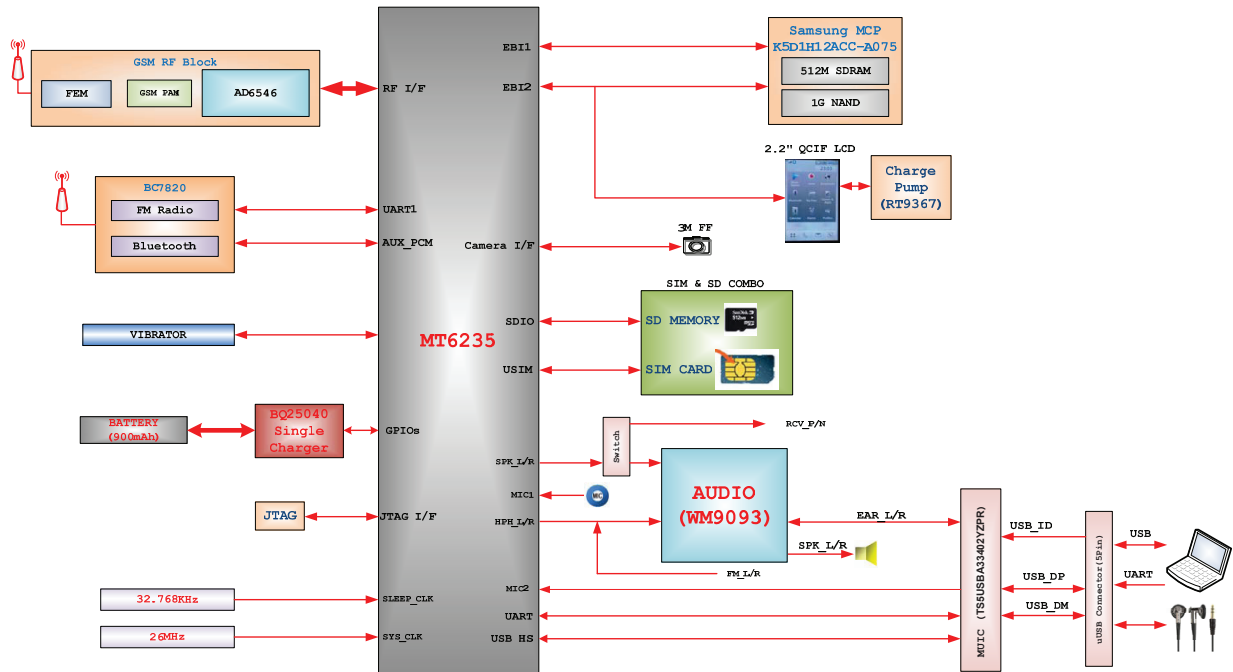
	Vc1(GSM850/900 Tx)	Vc2(GSM1800/1900 Tx)
GSM850 Rx	0.0~0.1 V	0.0~0.1 V
GSM900 Rx	0.0~0.1 V	0.0~0.1 V
GSM1800 Rx	0.0~0.1 V	0.0~0.1 V
GSM1900 Rx	0.0~0.1 V	0.0~0.1 V
GSM850/900 Tx	2.4~2.8 V	0.0~0.1 V
GSM1800/1900 Tx	0.0~0.1 V	2.4~2.8 V

[Table 3.2.4-1] FEM control logic



[Figure 3.2.4-1] FEM schematic

## 3.3 Functional Block Diagram



## 3. TECHNICAL BRIEF

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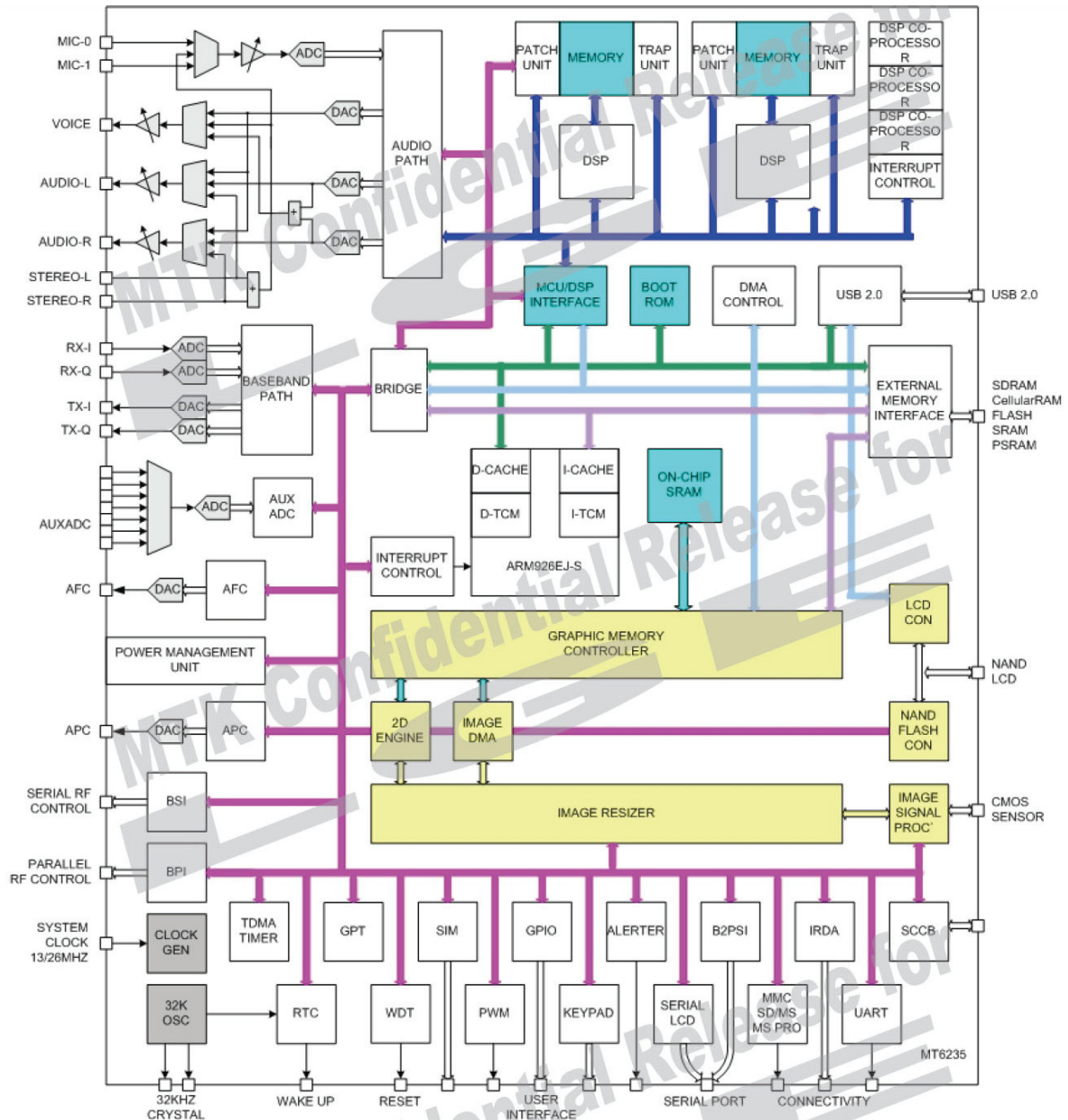
### 3.4 Baseband Processor Introductions

#### 3.4.1 General Description

Figure 2 depicts the block diagram of MT6235. Based on a dual-processor architecture, MT6235 integrates both an ARM926EJ-S core and a digital signal processor core. ARM926EJ-S is the main processor responsible for running high-level GSM/GPRS protocol software as well as multi-media applications. The digital signal processor manages the low-level MODEM as well as advanced audio functions. Except for a few mixed-signal circuitries, the other building blocks in MT6235 are connected to either the microcontroller or the digital signal processor. MT6235 consists of the following subsystems:

- Microcontroller Unit (MCU) Subsystem: includes an ARM926EJ-S RISC processor and its accompanying memory management and interrupt handling logics;
- Digital Signal Processor (DSP) Subsystem: includes a DSP and its accompanying memory, memory controller, and interrupt controller;
- MCU/DSP Interface: the junction at which the MCU and the DSP exchange hardware and software information;
- Microcontroller Peripherals: includes all user interface modules and RF control interface modules;
- Microcontroller Coprocessors: runs computing-intensive processes in place of the Microcontroller;
- DSP Peripherals: hardware accelerators for GSM/GPRS/EDGE channel codec;
- Multi-media Subsystem: integrates several advanced accelerators to support multi-media applications;
- Voice Front End: the data path for converting analog speech to and from digital speech;
- Audio Front End: the data path for converting stereo audio from an audio source;
- Baseband Front End: the data path for converting a digital signal to and from an analog signal from the RF modules;
- Timing Generator: generates the control signals related to the TDMA frame timing; and,
- Power, Reset and Clock Subsystem: manages the power, reset, and clock distribution inside MT6235.

## 3.4.2 Block Description



### 3. TECHNICAL BRIEF

#### 3.4.3 RF Interface (T\_OUT)

Ball	Name	Power Domain	Dir	Description
13X13				
<b>RF Parallel Control Unit</b>				
AE6	BPI_BUS0	VDD33	IO	RF hard-wire control bus 0
AD7	BPI_BUS1	VDD33	IO	RF hard-wire control bus 1
AC7	BPI_BUS2	VDD33	IO	RF hard-wire control bus 2
AC6	BPI_BUS3	VDD33	IO	RF hard-wire control bus 3
AE8	BPI_BUS4	VDD33	IO	RF hard-wire control bus 4
AD8	BPI_BUS5	VDD33	IO	RF hard-wire control bus 5
AC8	BPI_BUS6	VDD33	IO	RF hard-wire control bus 6
AB8	BPI_BUS7	VDD33	IO	RF hard-wire control bus 7
AE9	BPI_BUS8	VDD33	IO	RF hard-wire control bus 8
AD9	BPI_BUS9	VDD33	IO	RF hard-wire control bus 9
<b>RF Serial Control Unit</b>				
AC9	BSI_CS0	VDD33	IO	RF 3-wire interface chip select 0
AE10	BSI_DATA	VDD33	IO	RF 3-wire interface data output
AD10	BSI_CLK	VDD33	IO	RF 3-wire interface clock output

#### 3.4.4 ADC Channel

Ball	Name	Dir	Description	Function
T4	AUXADIN0	I	Auxiliary ADC input 0	External ADC Channel
U2	AUXADIN1	I	Auxiliary ADC input 1	External ADC Channel
U4	AUXADIN2	I	Auxiliary ADC input 2	External ADC Channel
V2	AUXADIN3	I	Auxiliary ADC input 3	External ADC Channel
(internal)	-	-	Auxiliary ADC_4	ISENSE(Fix)
(internal)	-	-	Auxiliary ADC_5	BATSENSE(Fix)
(internal)	-	-	Auxiliary ADC_6	CHIRIN(Fix)

#### 3.4.5 USIF Interface

Ball	Name	Power Domain	Dir	Description
13X13				
USB Interface				
AD20	USB_XTALI		IO	
AE20	USB_XTALO		IO	
AE21	VSSCA_USB		IO	
AD22	VSSCD_USB		IO	
AC21	VRT		IO	
AD23	VSS33_USB		IO	
AE22	USB_DP		IO	USB D+ Input/Output
AE23	USB_DM		IO	USB D- Input/Output
UART/IrDA Interface				
C25	URXD1	VDD33	IO	UART 1 receive data
C24	UTXD1	VDD33	IO	UART 1 transmit data
C23	UCTS1	VDD33	IO	UART 1 clear to send
B25	URTS1	VDD33	IO	UART 1 request to send
A24	URXD2	VDD33	IO	UART 2 receive data
B24	UTXD2	VDD33	IO	UART 2 transmit data
A23	URXD3	VDD33	IO	UART 3 receive data
B23	UTXD3	VDD33	IO	UART 3 transmit data

### 3. TECHNICAL BRIEF

#### 3.4.6 GPIO Map

Ball	Name	Power Domain	Dir	Description					PU/ PD	Res et
13X13					Mode0	Mode 1	Mode 2	Mode 3		
AC6	BPI_BUS 3	VDD33	IO	RF hard-wire control bus 3	<b>GPIO19</b>	BPI_B US3			PU/ PD	PD
AC8	BPI_BUS 6	VDD33	IO	RF hard-wire control bus 6	<b>GPIO20</b>	BPI_B US6			PU/ PD	PD
AB8	BPI_BUS 7	VDD33	IO	RF hard-wire control bus 7	<b>GPIO21</b>	BPI_B US7			PU/ PD	PD
AE9	BPI_BUS 8	VDD33	IO	RF hard-wire control bus 8	<b>GPIO22</b>	BPI_B US8			PU/ PD	PD
AD9	BPI_BUS9	VDD33	IO	RF hard-wire control bus 9	<b>GPIO23</b>	BPI_BU S9	BSI_CS 1		PU/P D	PD
AC10	PWM0	VDD33	IO	Pulse width modulated signal 0	<b>GPIO39</b>	PWM0			PU/P D	PD
AB10	PWM1	VDD33	IO	Pulse width modulated signal 1	<b>GPIO40</b>	PWM1	BSI_RFI N		PU/P D	PD
AC5	PWM2	VDD33_CAM	IO	Pulse width modulated signal 2	<b>GPIO17</b>	PWM2		D2_TID 5	PU/P D	PD
AE5	PWM3	VDD33_CAM	IO	Pulse width modulated signal 3	<b>GPIO18</b>	PWM3		D2_TID 6	PU/P D	PD
AE4	SCL	VDD33_CAM	IO		<b>GPIO15</b>	SCL		D2_TID 3	PU/P D	PU
AD5	SDA	VDD33_CAM	IO		<b>GPIO16</b>	SDA		D2_TID 4	PU/P D	PU
AC11	LSCK	VDD33_LCD	IO	Serial display interface data output	<b>GPIO24</b>	LSCK	DSP_G PO2	IRQ0	PU/P D	PD
U11	LSA0	VDD33_LCD	IO	Serial display interface address output	<b>GPIO25</b>	LSA0	DSP_G PO3	IRQ1	PU/P D	PD
AD12	LSDA	VDD33_LCD	IO	Serial display interface	<b>GPIO26</b>	LSDA	CLKM1	TDTIRQ	PU/P	PD

### 3. TECHNICAL BRIEF

				clock output					D	
AE12	LSCE0B	VDD33_LCD	IO	Serial display interface chip select 0 output	<b>GPIO27</b>	LSCE0B	CLKM2	TCTIRQ 2	PU/P D	PU
AC12	LSCE1B	VDD33_LCD	IO	Serial display interface chip select 1 output	<b>GPIO28</b>	LSCE1B	LPCE2B	TCTIRQ 1	PU/P D	PU
AB12	LPCE1B	VDD33_LCD	IO	Parallel display interface chip select 1 output	<b>GPIO29</b>	LPCE1B	NCE1B	TEVTVA L	PU/P D	PU
AE13	LPTE	VDD33_LCD	IO		<b>GPIO30</b>	LPTE			PU/P D	PD
AD14	NLD17	VDD33_LCD	IO	Parallel LCD/NAND- Flash Data 17	<b>GPIO31</b>	NLD17			PU/P D	PD
AC14	NLD16	VDD33_LCD	IO	Parallel LCD/NAND- Flash Data 16	<b>GPIO32</b>	NLD16			PU/P D	PD
AC18	NRNB	VDD33_LCD	IO	NAND-Flash Read/Busy Flag	GPIO33	<b>NRNB</b>			PU/P D	PU
AB18	NCLE	VDD33_LCD	IO	NAND-Flash Command Latch Signal	GPIO34	<b>NCLE</b>			PU/P D	
AE19	NALE	VDD33_LCD	IO	NAND-Flash Address Latch Signal	GPIO35	<b>NALE</b>			PU/P D	
AD19	NWEB	VDD33_LCD	IO	NAND-Flash Write Strobe	GPIO36	<b>NWEB</b>			PU/P D	
AC19	NREB	VDD33_LCD	IO	NAND-Flash Read Strobe	GPIO37	<b>NREB</b>			PU/P D	
AB19	NCEB	VDD33_LCD	IO	NAND-Flash Chip select output	GPIO38	<b>NCE0B</b>			PU/P D	
U10	SRCLKEN AN	VDD33	IO	External TCXO enable output active low	GPIO42	<b>SRCLK ENAN</b>			PU/P D	
AE11	SRCLKEN A	VDD33	IO	External TCXO enable output active high	GPIO41	<b>SRCLK ENA</b>			PU/P D	
AD11	SRCLKEN AI	VDD33	IO	External TCXO enable input	<b>GPIO43</b>	SRCLKE NAI			PU/P D	PD
A22	KCOL7	VDD33	IO	Keypad column 7	<b>GPIO55</b>	KCOL7	IRDA_P		PU/P	PU

### 3. TECHNICAL BRIEF

							DN		D	
B22	KCOL6	VDD33	IO	Keypad column 6	<b>GPIO56</b>	KCOL6			PU/P D	PU
C20	KROW7	VDD33	IO	Keypad row 7	<b>GPIO57</b>	KROW7	CLKM4		PU/P D	PD
D20	KROW6	VDD33	IO	Keypad row 6	<b>GPIO58</b>	KROW6			PU/P D	PD
E24	EINT3	VDD33	IO	External interrupt 3	<b>GPIO44</b>	EINT3	DRF_D ATA	IRQ2	PU/P D	PU
E23	EINT4	VDD33	IO	External interrupt 4	<b>GPIO45</b>	EINT4	DRF_E N	CLKM3	PU/P D	PU
D23	EINT5	VDD33	IO	External interrupt 5	<b>GPIO46</b>	EINT5	EDICK		PU/P D	PU
D25	EINT6	VDD33	IO	External interrupt 6	<b>GPIO47</b>	EINT6	EDIWS		PU/P D	PU
D24	EINT7	VDD33	IO	External interrupt 7	<b>GPIO48</b>	EINT7	EDIDAT		PU/P D	PU
K17	MFIQ	VDD33_EMI	IO	Interrupt to MCU	<b>GPIO66</b>	:nFIQ	CLKM7		PU/P D	PU
T17	EADMUX	VDD33_EMI	IO		GPIO65	<b>EADM UX</b>	CLKM6		PU/P D	
AD25	EA26	VDD33_EMI	IO	External memory address bus 26	GPIO64	<b>EA26</b>	CLKM5		PU/P D	
B16	MCCM0	VDD33_MC	IO	SD Command/MS Bus State Output	<b>GPIO67</b>	MC0C M0		TDMA_ CK	PU/P D	PU
C16	MCDA0	VDD33_MC	IO	SD Serial Data IO 0/MS Serial Data IO	<b>GPIO68</b>	MC0DA 0		TDMA_ D1	PU/P D	PU
D16	MCDA1	VDD33_MC	IO	SD Serial Data IO 1	<b>GPIO69</b>	MC0DA 1		TDMA_ D0	PU/P D	PU
J16	MCDA2	VDD33_MC	IO	SD Serial Data IO 2	<b>GPIO70</b>	MC0DA 2		TDMA_ FS	PU/P D	PU
C15	MCDA3	VDD33_MC	IO	SD Serial Data IO 3	<b>GPIO71</b>	MC0DA 3			PU/P D	PU
D15	MCCK	VDD33_MC	IO	SD Serial Clock/MS	<b>GPIO72</b>	MC0CK			PU/P	PU

### 3. TECHNICAL BRIEF

				Serial Clock Output					D	
J15	MCPWRO N	VDD33_MC	IO	SD Power On Control Output	<b>GPIO73</b>	MCOP WRON	CLKM8		PU/P D	PU
C14	MCWP	VDD33_MC	IO	SD Write Protect Input	<b>GPIO74</b>	MCOW P	CLKM9		PU/P D	PU
D14	MCINS	VDD33_MC	IO	SD Card Detect Input	<b>GPIO75</b>	MC0IN S			PU/P D	PU
C23	UCTS1	VDD33	IO	UART 1 clear to send	GPIO49	<b>UCTS1</b>	UCTS2		PU/P D	PU
B25	URTS1	VDD33	IO	UART 1 request to send	GPIO50	<b>URTS1</b>	URTS2		PU/P D	
A24	URXD2	VDD33	IO	UART 2 receive data	<b>GPIO51</b>	URXD2	UCTS3		PU/P D	PU
B24	UTXD2	VDD33	IO	UART 2 transmit data	<b>GPIO52</b>	UTXD2	URTS3		PU/P D	PU
A23	URXD3	VDD33	IO	UART 3 receive data	<b>GPIO53</b>	URXD3	IRDA_R XD		PU/P D	PU
B23	UTXD3	VDD33	IO	UART 3 transmit data	<b>GPIO54</b>	UTXD3	IRDA_T XD		PU/P D	PU
D18	DAICLK	VDD33	IO	DAI clock output	<b>GPIO59</b>	DAICLK			PU/P D	PD
A17	DAIPCM OUT	VDD33	IO	DAI pcm data out	<b>GPIO60</b>	DAIPC MOUT			PU/P D	PD
B17	DAIPCM IN	VDD33	IO	DAI pcm data input	<b>GPIO61</b>	DAIPC MIN			PU/P D	PD
C17	DAIRST	VDD33	IO	DAI reset signal input	<b>GPIO62</b>	DAIRST			PU/P D	PD PU
D17	DAISYNC	VDD33	IO	DAI frame synchronization signal output	<b>GPIO63</b>	DAISY NC			PU/P D	PD
AA2	CMRST	VDD33_CAM	IO	CMOS sensor reset signal output	<b>GPIO0</b>	CMRST	CLKM0	DSP_G PO0	PU/P D	PD
AA3	CMPDN	VDD33_CAM	IO	CMOS sensor power down control	<b>GPIO1</b>	CMPD N		DSP_G PO1	PU/P D	PD

### 3. TECHNICAL BRIEF

AB3	CMVREF	VDD33_CAM	IO	Sensor vertical reference signal input	<b>GPIO2</b>	CMVRE F	TBTXE N	D1_TID 0	PU/P D	PD
AB2	CMHREF	VDD33_CAM	IO	Sensor horizontal reference signal input	<b>GPIO3</b>	CMHRE F	TBTXFS		PU/P D	PD
AA4	CMPCLK	VDD33_CAM	IO	CMOS sensor pixel clock input	<b>GPIO4</b>	CMPCL K	TBRXE N	D1_TID 1	PU/P D	PD
AB6	CMMCLK	VDD33_CAM	IO	CMOS sensor master clock output	<b>GPIO5</b>	CMMC LK	TBRXFS		PU/P D	PD
AC2	CMDAT7	VDD33_CAM	IO	CMOS sensor data input 7	<b>GPIO6</b>	CMDAT 7		D1ICK	PU/P D	PD
AC3	CMDAT6	VDD33_CAM	IO	CMOS sensor data input 6	<b>GPIO7</b>	CMDAT 6		D1ID	PU/P D	PD
AC1	CMDAT5	VDD33_CAM	IO	CMOS sensor data input 5	<b>GPIO8</b>	CMDAT 5		D1IMS	PU/P D	PD
AD1	CMDAT4	VDD33_CAM	IO	CMOS sensor data input 4	<b>GPIO9</b>	CMDAT 4		D2ICK	PU/P D	PD
AE2	CMDAT3	VDD33_CAM	IO	CMOS sensor data input 3	<b>GPIO10</b>	CMDAT 3		D2ID	PU/P D	PD
AD3	CMDAT2	VDD33_CAM	IO	CMOS sensor data input 2	<b>GPIO11</b>	CMDAT 2		D2IMS	PU/P D	PD
AD4	CMDAT1	VDD33_CAM	IO	CMOS sensor data input 1	<b>GPIO12</b>	CMDAT 1		D2_TID 0	PU/P D	PD
AE3	CMDAT0	VDD33_CAM	IO	CMOS sensor data input 0	<b>GPIO13</b>	CMDAT 0		D2_TID 1	PU/P D	PD
AC4	CMFLAS H	VDD33_CAM	IO		<b>GPIO14</b>	CMFLA SH		D2_TID 2	PU/P D	PD

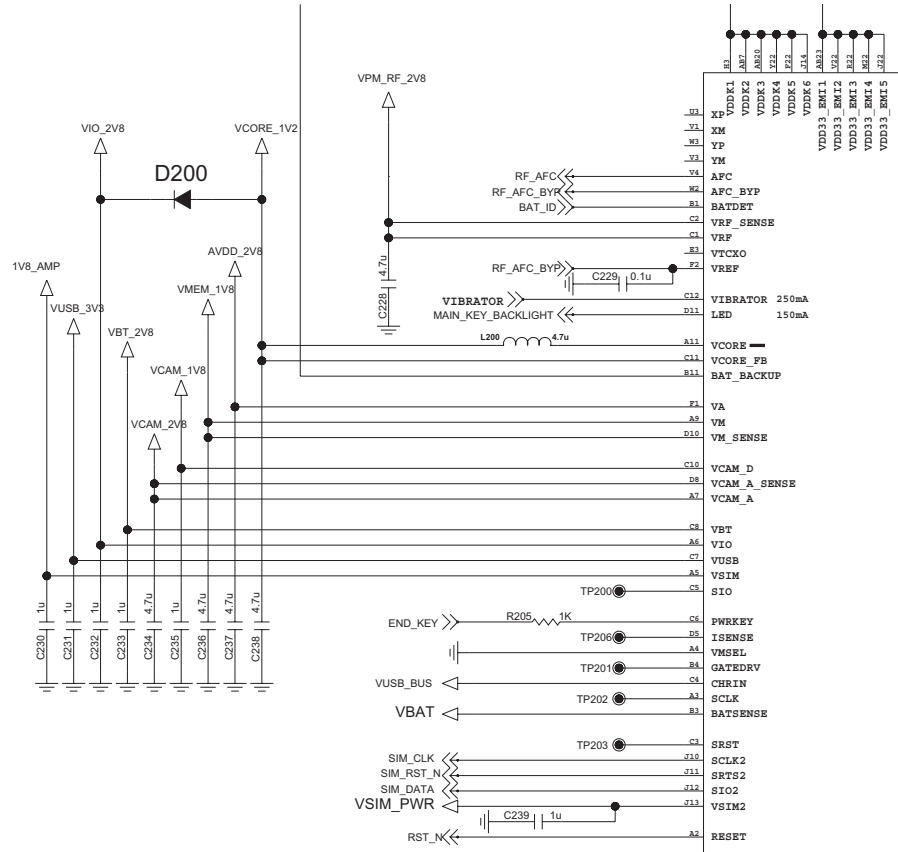
### 3.4.6 Power Management Unit

#### General Description

Power management unit, so called PMU, is integrated into analog part. To facilitate software control and interface design, PMU control share the CCI interface along with other analog parts, such as BBTX, BBRX, and ABL, etc.

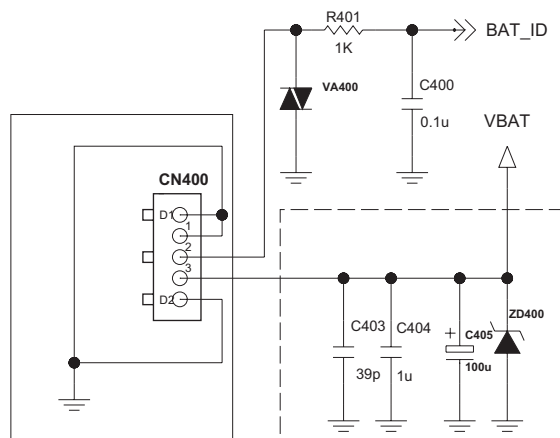
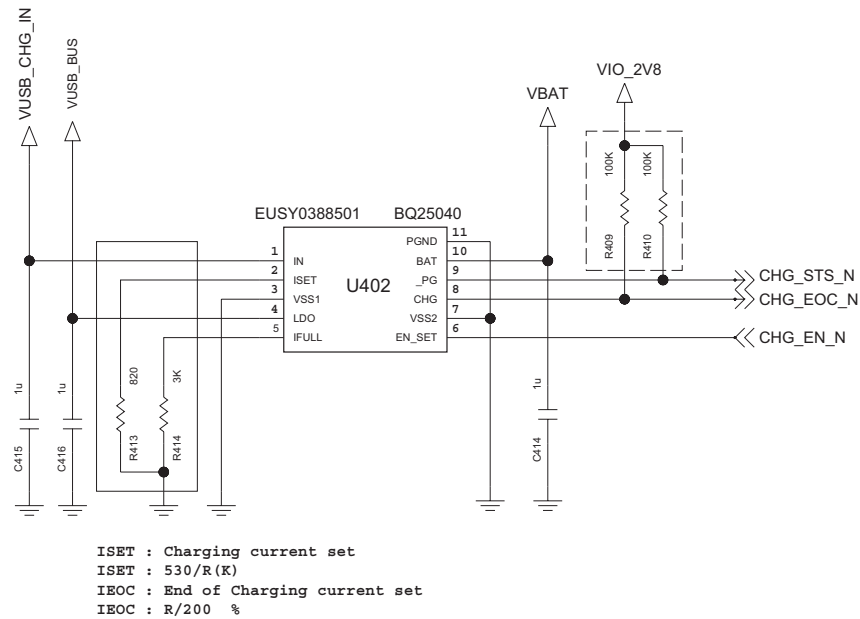
Power	Available Vout(V)	Max Current(mA)	Output Capacitor(F)	Description (Connected Device)
Vcore	1.2/0.9(DC/DC)	350	4.7u	Digital core
VIO	2.8	100	1u	Digital IO
VRF	2.8	250	4.7u	RF chip
VA	2.8	125	4.7u	Analog baseband
VRTC	1.2	0.6	100n	RTC
VM	1.8/2.8	300	4.7u	External Memory, Selectable
VSIM	1.8/3.0	80	1u	SIM Card, Selectable
VSIM2	1.8/3.0	20		SIM Card2, Selectable
VTCXO	2.8	40	1u	13/26MHz Reference
VBT	2.8/3.0	100	1u	Memory Card of Bluetooth
VUSB	3.3	75	1u	USB
VCAM_A	1.5/1.8/2.5/2.8	250	4.7u	Analog Camera Power
VCAM_D	1.3/1.5/1.8/2.8	75	1u	Digital Camera Power

### 3. TECHNICAL BRIEF

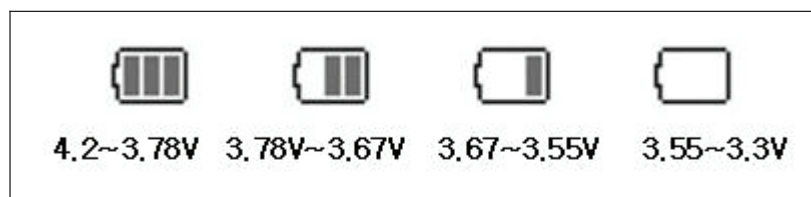


[Figure 3.4.6-1] Circuit Diagram

## 3.5 Charging Control



[Figure 3.5-1] Circuit Diagram



[Figure 3.5-2] Battery discharging voltage

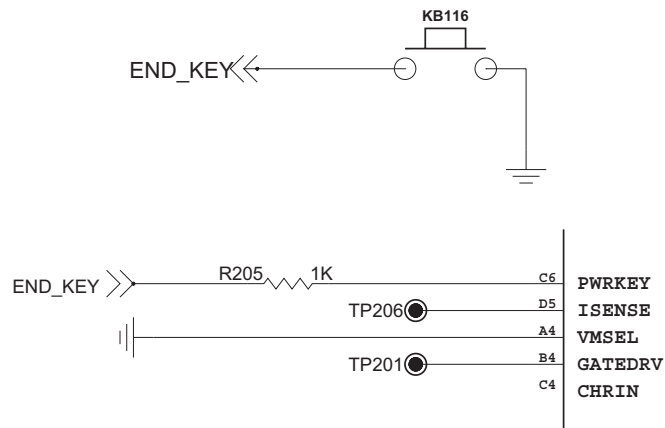
### 3. TECHNICAL BRIEF

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1. Charging method : CC-CV(pulse charging)
2. Charger detect voltage : 5.0 V
3. Charging time : 2h 40m
4. Charging current : 610 mA
5. CV voltage : 4.1 V
6. Cutoff current : below 60 mA
7. Full charge indication current (icon stop current) : 60 mA
8. Recharge voltage : 4.15 V
9. Low battery alarm
  - a. Idle : below 3.55 V
  - b. call : below 3.55 V
10. Low battery alarm interval
  - a. Idle : 3 min
  - b. Dedicated : 1 min
11. Switch-off voltage : 3.3 V
12. Charging temperature adc range
  - a.  $\sim -20^{\circ}\text{C}$  : low charging voltage operation (3.6 V  $\sim$  3.8 V) .
  - b.  $-20^{\circ}\text{C} \sim 60^{\circ}\text{C}$  : standard charging (up to 4.2 V)
  - c.  $60^{\circ}\text{C} \sim$  : low charging voltage operation (3.6V  $\sim$  3.8V)

### 3.6 Power ON/OFF

#### 3.6.1 Power key detect

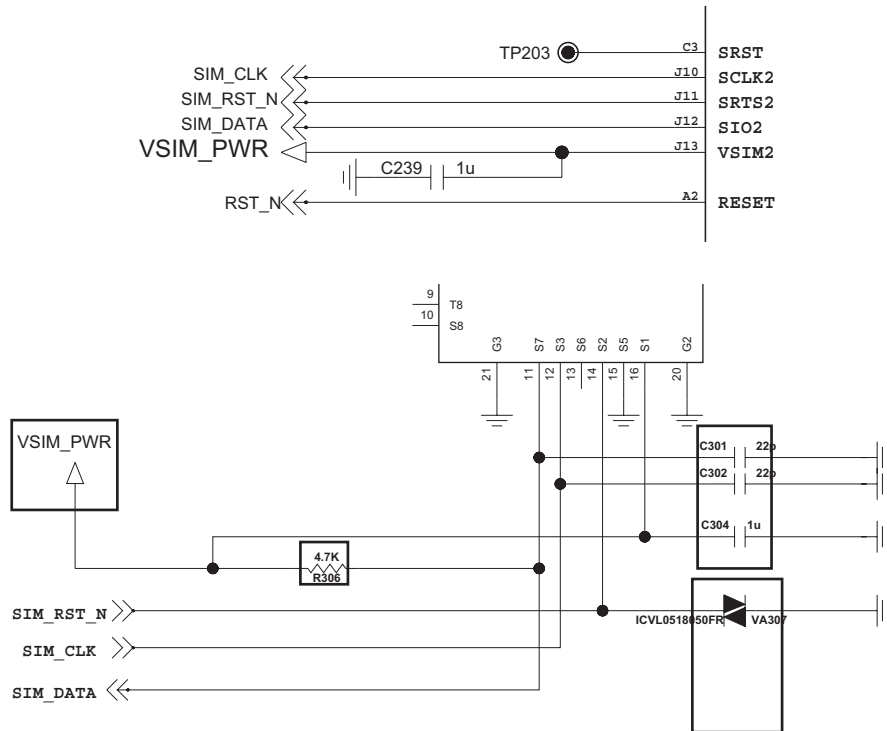


#### 3.6.2 Charger detect

Power is ON when Charger with specific resistor value(130K $\Omega$  or 56K $\Omega$ )

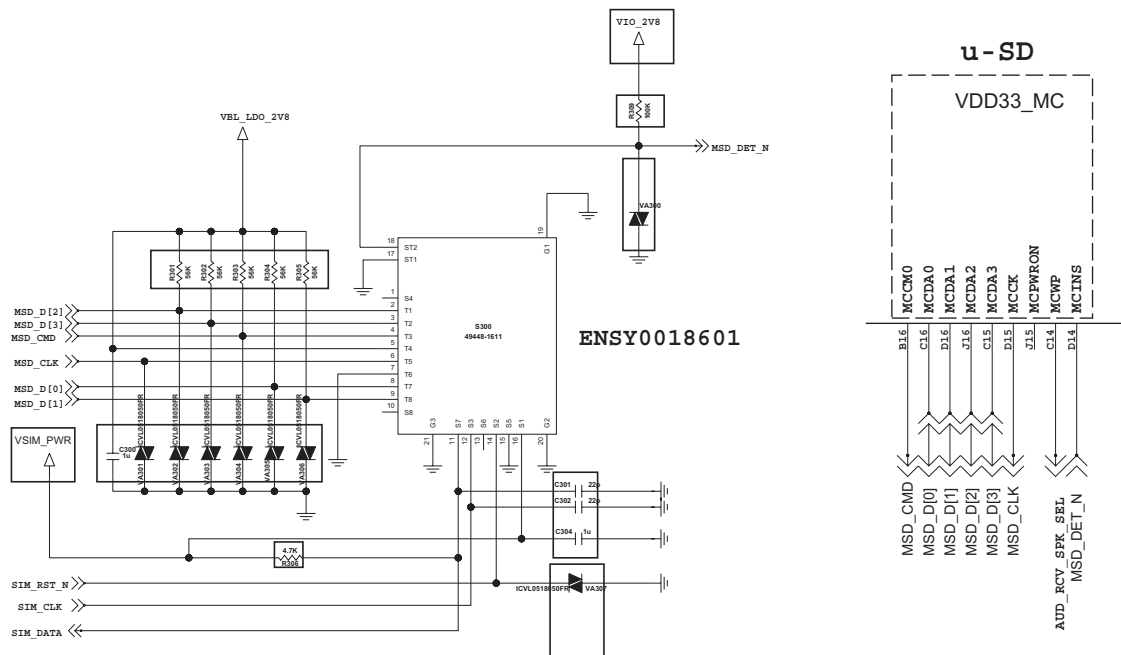
### 3. TECHNICAL BRIEF

#### 3.7 SIM Interface



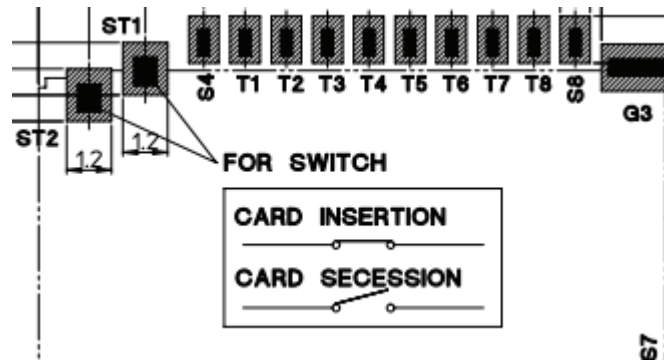
SIM+SD Combo Socket (ENSY0018601)

#### 3.8 MICRO SD Card Socket (ENSY0018601)



The MicroSD Memory Module has eight exposed contacts on one side. The S-Gold3 is connected to the module using a dedicated eight-pin connector

### 3. TECHNICAL BRIEF

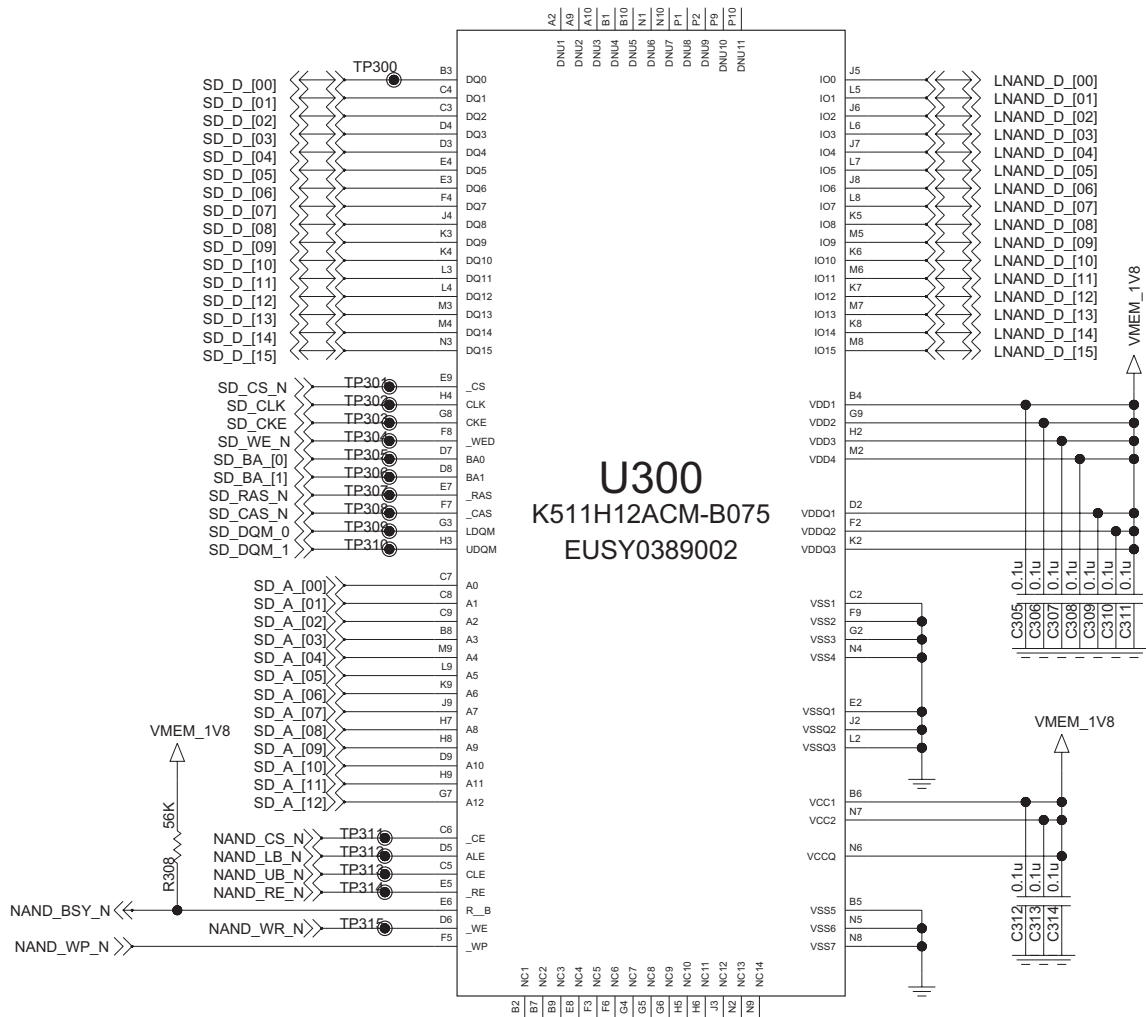


[Figure 3.8-1] ]Micro SD Memory Card Detection Scheme

Table 3.8.1 Micro SD memory pad assign.

SD mode			
in No.	Name	Type	Description
T1	DAT2	I/O	Data bit [2]
T2	CD/DAT3	I/O	Data bit [3]
T3	CMD	I/O	Command response
T4	VDD	Power	Power supply
T5	CLK	I	Clock
T6	VSS	Ground	Power ground
T7	DAT0	I/O	Data bit [0]
T8	DAT1	I/O	Data bit [1]

## 3.9 Memory



[figure 3.9-1] Circuit Diagram

### 3. TECHNICAL BRIEF

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The K511H12ACM is a Multi Chip Package Memory which combines 1Gbit NAND Flash Memory and 512Mbit SDR synchronous high data rate Dynamic RAM. NAND cell provides the most cost-effective solution for the solid state application market. A program operation can be performed in typical 250 $\mu$ s(TBD) on the (1K+32)Word page and an erase operation can be performed in typical 2ms on a (64K+2K)Word block. Data in the data register can be read out at 42ns cycle time per Word. The I/O pins serve as the ports for address and data input/output as well as command input. The on-chip write controller auto-mates all program and erase functions including pulse repetition, where required, and internal verification and margining of data. Even the write-intensive systems can take advantage of the device's extended reliability of 100K program/erase cycles by providing ECC(Error Correcting Code) with real time mapping-out algorithm. The device is an optimum solution for large nonvolatile storage applications such as solid state file storage and other portable applications requiring non-volatility.

In 512Mb Mobile SDR SDRAM is 536,870,912 bits synchronous high data rate Dynamic RAM organized as 4 x 8,388,608 words by 16 bits, fabricated with SAMSUNG's high performance CMOS technology. Synchronous design allows precise cycle control with the use of system clock and I/O transactions are possible on every clock cycle. Range of operating frequencies, programmable burst lengths and programmable latencies allow the same device to be useful for a variety of high bandwidth and high performance memory system applications.

The K511H12ACM is suitable for use in data memory of mobile communication system to reduce not only mount area but also power consumption. This device is available in 107-ball FBGA Type.

#### <Common>

- Operating Temperature : -25°C ~ 85°C
- Package : 107ball FBGA Type - 10.5x13x1.2mmt, 0.8mm pitch

#### <NAND Flash>

- Voltage Supply : 1.7V ~ 1.95V
- Organization
  - Memory Cell Array :  
(64M + 2M) x 16bit for 1Gb
  - Data Register : (1K + 32) x 16bit
- Automatic Program and Erase
  - Page Program : (1K + 32)Word
  - Block Erase : (64K + 2K)Word
- Page Read Operation
  - Page Size : (1K + 32)Word
  - Random Read : 40 $\mu$ s(Max. TBD)
  - Serial Access : 42ns(Min. TBD)
- Fast Write Cycle Time
  - Page Program time : 250 $\mu$ s(Typ. TBD)

- Block Erase Time : 2ms(Typ. TBD)
- Command/Address/Data Multiplexed I/O Port
- Hardware Data
- Program/Erase Lockout During Power Transitions
- Reliable CMOS Floating-Gate Technology
- Endurance : 100K Program/Erase Cycles  
with 1bit/256Word ECC for x16
- Command Driven Operation
- Unique ID for Copyright Protection

#### <Mobile SDR SDRAM>

- VDD/VDDQ = 1.8V/1.8V
- LVCMOS compatible with multiplexed address.
- Four banks operation.
- MRS cycle with address key programs.
  - CAS latency (3).
  - Burst length (1, 2, 4, 8 & Full page).
  - Burst type (Sequential & Interleave).
- EMRS cycle with address key programs.
- All inputs are sampled at the positive going edge of the system clock.
- Burst read single-bit write operation.
- Special Function Support.
  - PASR (Partial Array Self Refresh).
  - Internal TCSR (Temperature Compensated Self Refresh)
  - Driver Strength (Full, 1/2, 1/4, 1/8, 3/4, 3/8, 5/8, 7/8)
- DQM for masking.
- Auto refresh.
- 64ms refresh period (8K cycle).
- Clock Stop capability.

#### Address configuration

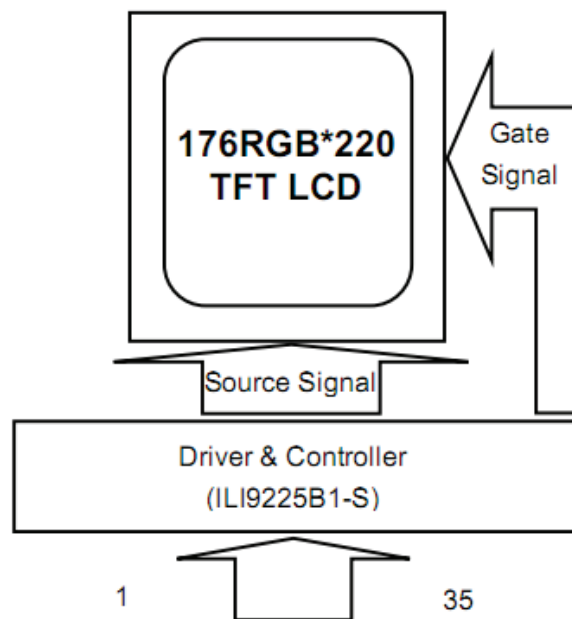
Organization	Bank	Row	Column
32M x 16	BA0,BA1	A0 - A12	A0 - A9

### 3. TECHNICAL BRIEF

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#### 3.10 LCD Display

Display Mode	Transmissive Type, Positive mode
Display Format	RGB vertical stripe
Color	262K color
Input Data	MCU Interface : 16 bits 8080-series parallel interface
Viewing Direction	12 O'clock (Gray scale inversion)
Backlight	White LED
Driver IC	ILI9225B1-S



[Figure 3.8-1] LCD Module Operation Block Diagram

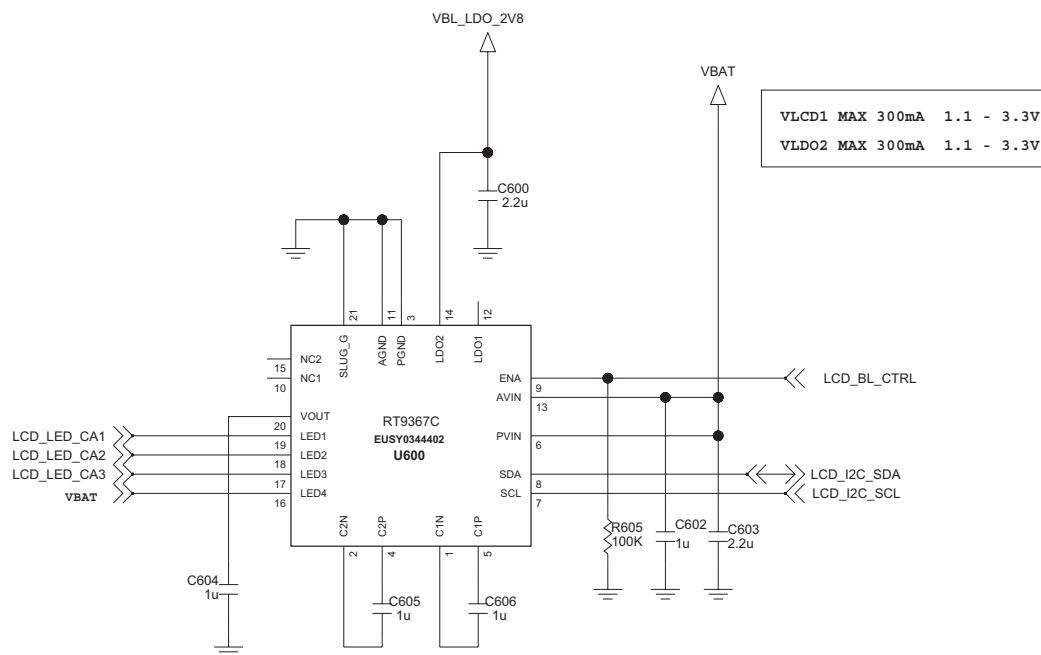
#### Pin Description

NO	Pin Name	Description
1	LED(An)	LED (+)
2	LED(Ca1)	LED1 (-)
3	LED(Ca2)	LED2 (-)
4	LED(Ca3)	LED3 (-)
5	GND	Ground
6	IF_MODE2(IM3)	Select the MPU system interface mode(Note1)
7	GND	Ground
8	IF_MODE2(IM0)	Select the MPU system interface mode(Note1)
9	VSYNC_OUT	Tearing effect pin
10	/RD	Read signal pin
11	/WR	Write signal pin
12	RS	Register select signal.
13	/RESET	Reset pin
14	/CS	Chip select input pin
15	GND	Ground
16~31	D15~ D0	16-bit parallel data bus for 80-system Interface operation.
32	MAKER_ID(Low)	ID Pin : Ground
33	VCC2(I/O)(1.65~3.3)	Power supply for Digital
34	VCC1(2.6~3.3)	Power supply for Analog
35	GND	Ground

### 3. TECHNICAL BRIEF

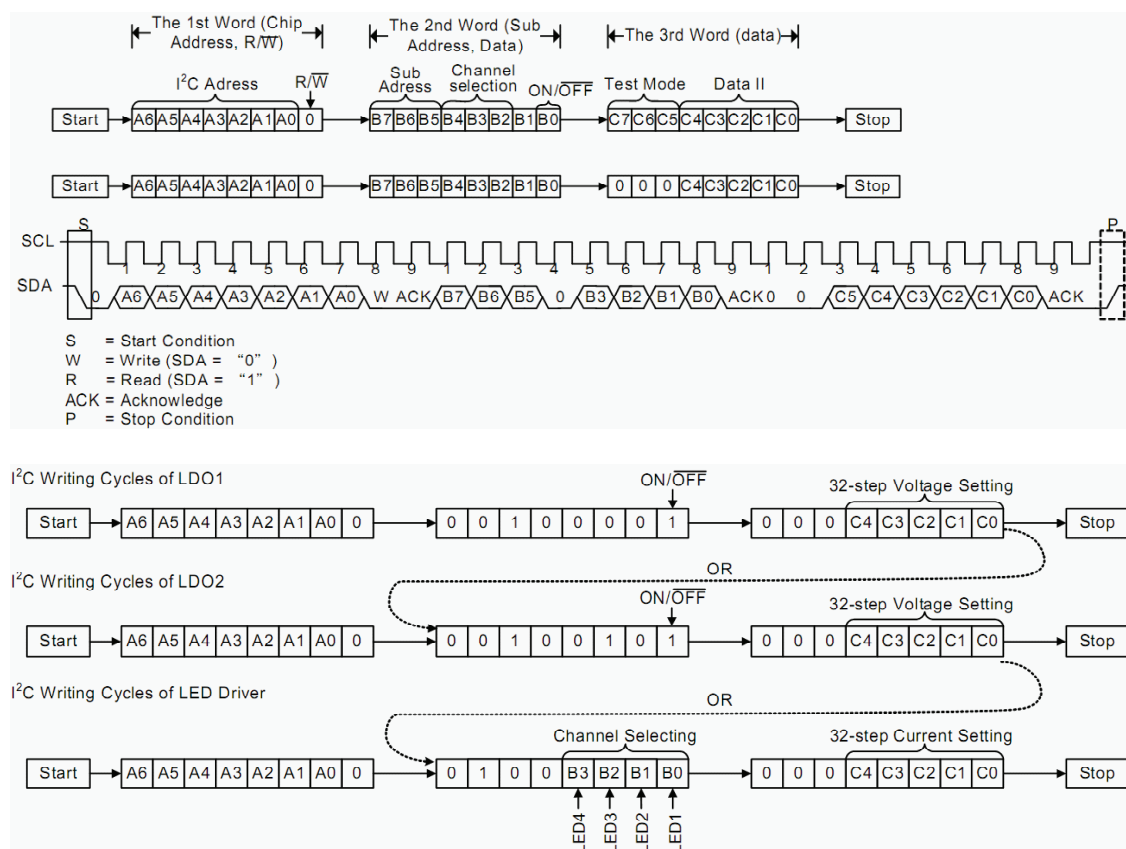
#### 3.11 LCD Backlight Illumination

The RT9367C is an integrated solution for backlighting and phone camera input supply. The part contains a charge pump white LED driver and dual low dropout linear regulators. This IC can be shut down by pulling EN low. In the section of charge pump, The RT9367C can power up 4 white LEDs with regulated constant current for uniform intensity. Each channel (LED1-LED4) can support up to 25mA. The part maintains highest efficiency by utilizing a x1/x1.5/x2 fractional charge pump and low dropout current regulators. An internal 5-bit DAC is used for brightness control. Users can easily configure up to 32-step of LED current by I2C interface. In the section of linear regulator, The RT9367C comprises a dual channel, low noise, and low dropout regulator sourcing up to 300mA at each channel. The range of output voltage can be configured from 1.1V to 3.3V by I2C interface. The outputs of LDO offer 3% accuracy and low dropout voltage of 250mV @ 300mA. The LDO also provides current limiting and output short circuit thermal folded back protection.



[Figure 3.11-1] Circuit Diagram

The figure 1 shows the timing diagram of I2C interface. The RT9367C communicates with a host (master) using the standard I2C 2-wire interface. The two bus lines of SCL and SDA must be pulled to high when the bus is not in use. External pull-up resistors between VCC and SDA/SCL pin are necessary. The recommended pull-up resistor value range is from 2kΩ to 10kΩ. After the START condition, the I2C master sends a chip address. This address is seven bits long followed by an eighth bit which is a data direction bit (R/W). The RT9367C address is 1010100 (54h) and is a receive-only (slave) device. The second word selects the register to which the data will be written. The third word contains data to write to the selected register.



**[Figure 3.11-2] RT9367C I2C Writing Cycles for LDO and LED Driver**

Figure 3.11-2 shows the writing information of dual LDO and LED current. In the second word, the sub-address of dual LDO is "001" and the sub-address of LED Driver is "010". For LDO, the LDO1 address is defined as "000", LDO2 address is defined as "001". The data of second byte (B0 to B3), a "0" indicates a DISABLE and a "1" indicates an ENABLE function. The data of third byte (C0 to C4) indicates a 32-steps setting of LDO1, LDO2 output voltage or the LED current of backlight.

### 3. TECHNICAL BRIEF

Table 1. LDO Voltage Setting

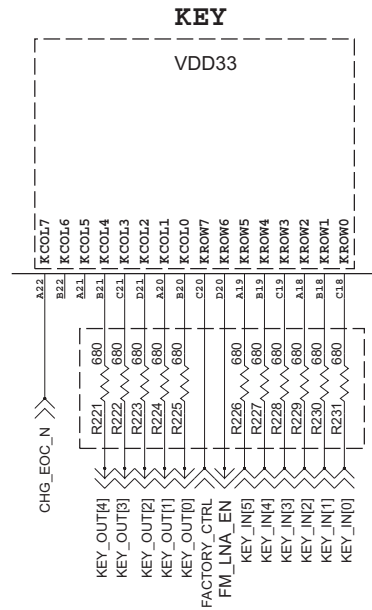
Code C4~C0	Voltage (V)		Code C4~C0	Voltage (V)		Code C4~C0	Voltage (V)		Code C4~C0	Voltage (V)	
	LDO1	LDO2		LDO1	LDO2		LDO1	LDO2		LDO1	LDO2
00000	1.75	1.10	01000	2.15	1.50	10000	2.55	2.55	11000	2.95	2.95
00001	1.80	1.15	01001	2.20	1.55	10001	2.60	2.60	11001	3.00	3.00
00010	1.85	1.20	01010	2.25	1.60	10010	2.65	2.65	11010	3.05	3.05
00011	1.90	1.25	01011	2.30	1.65	10011	2.70	2.70	11011	3.10	3.10
00100	1.95	1.30	01100	2.35	1.70	10100	2.75	2.75	11100	3.15	3.15
00101	2.00	1.35	01101	2.40	1.75	10101	2.80	2.80	11101	3.20	3.20
00110	2.05	1.40	01110	2.45	1.80	10110	2.85	2.85	11110	3.25	3.25
00111	2.10	1.45	01111	2.50	2.50	10111	2.90	2.90	11111	3.30	3.30

Table 2. LDO Current Setting

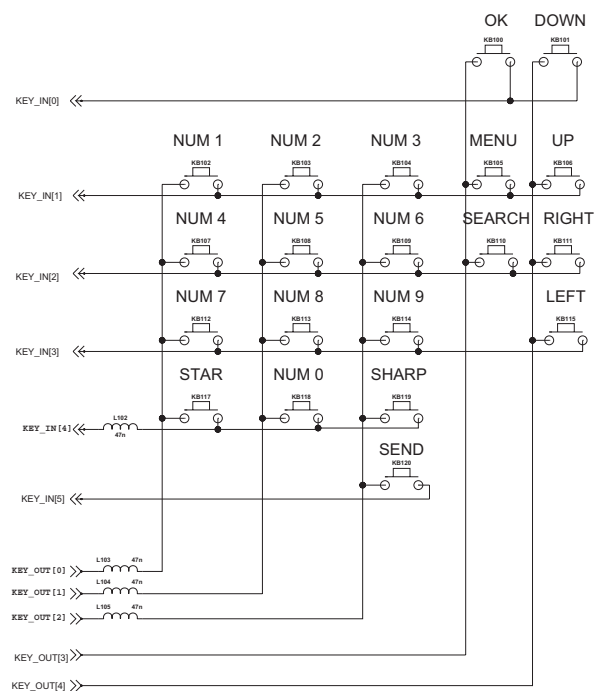
Code C4~C0	LED Current (mA)	Code C4~C0	LED Current (mA)	Code C4~C0	LED Current (mA)	Code C4~C0	LED Current (mA)
00000	0.8	01000	7.0	10000	13.3	11000	19.5
00001	1.6	01001	7.8	10001	14.0	11001	20.3
00010	2.3	01010	8.6	10010	14.8	11010	21.1
00011	3.1	01011	9.4	10011	15.6	11011	21.8
00100	3.9	01100	10.1	10100	16.4	11100	22.6
00101	4.7	01101	10.9	10101	17.2	11101	23.4
00110	5.5	01110	11.7	10110	17.9	11110	24.2
00111	6.2	01111	12.5	10111	18.7	11111	25.0

## 3.12 Keypad Switching & Scanning

There are 5 columns and 6 rows to operate Key



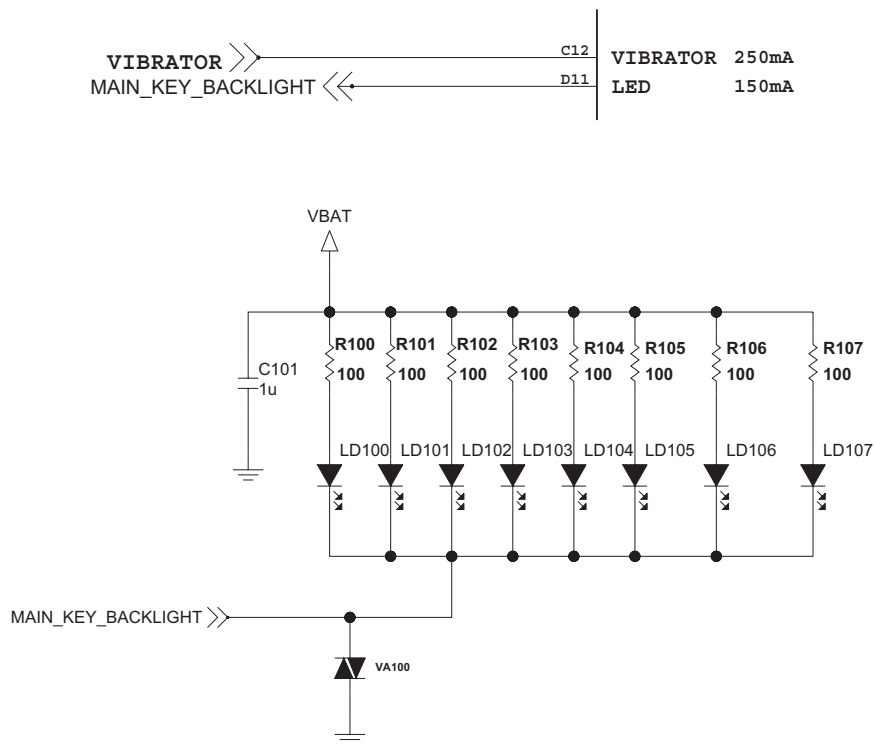
[Figure 3.12-1] Circuit Diagram (Main BB chip pin map)



[Figure 3.12-2] Circuit Diagram (Key map)

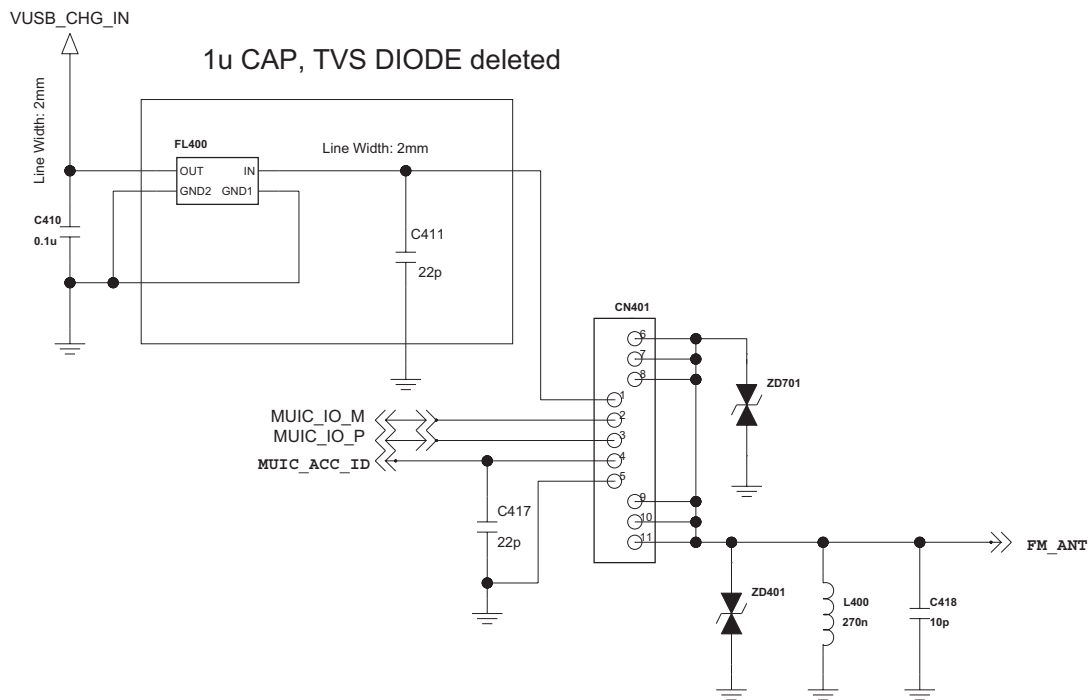
### 3. TECHNICAL BRIEF

#### 3.13 Keypad Backlight Illumination



[Figure 3.13-1] Circuit Diagram

## 3.14 u USB Multimedia interface connector

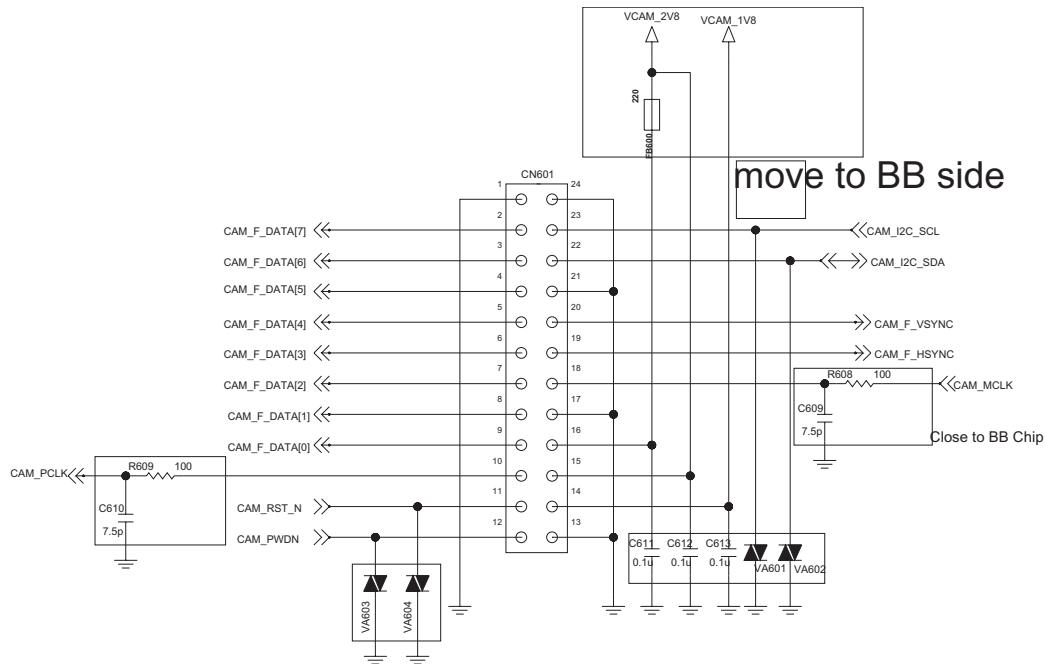


[Figure 3.14-1] Circuit Diagram

Pin No	LG-S310 MMI	
	Pin Function	Description
1	V_BUS	Charger voltage
2	MUIC_DM	USB/ UART/Remote control Key ADC/ Headset left sound
3	MUIC_DP	USB/ UART/Remote control interrupt/ Headset Right sound
4	MUIC_ID	
5	GND	
6	FM_ANT	FM radio antenna
7	FM_ANT	FM radio antenna
8	FM_ANT	FM radio antenna
9	FM_ANT	FM radio antenna
10	FM_ANT	FM radio antenna
11	FM_ANT	FM radio antenna

### 3. TECHNICAL BRIEF

#### 3.15 Camera

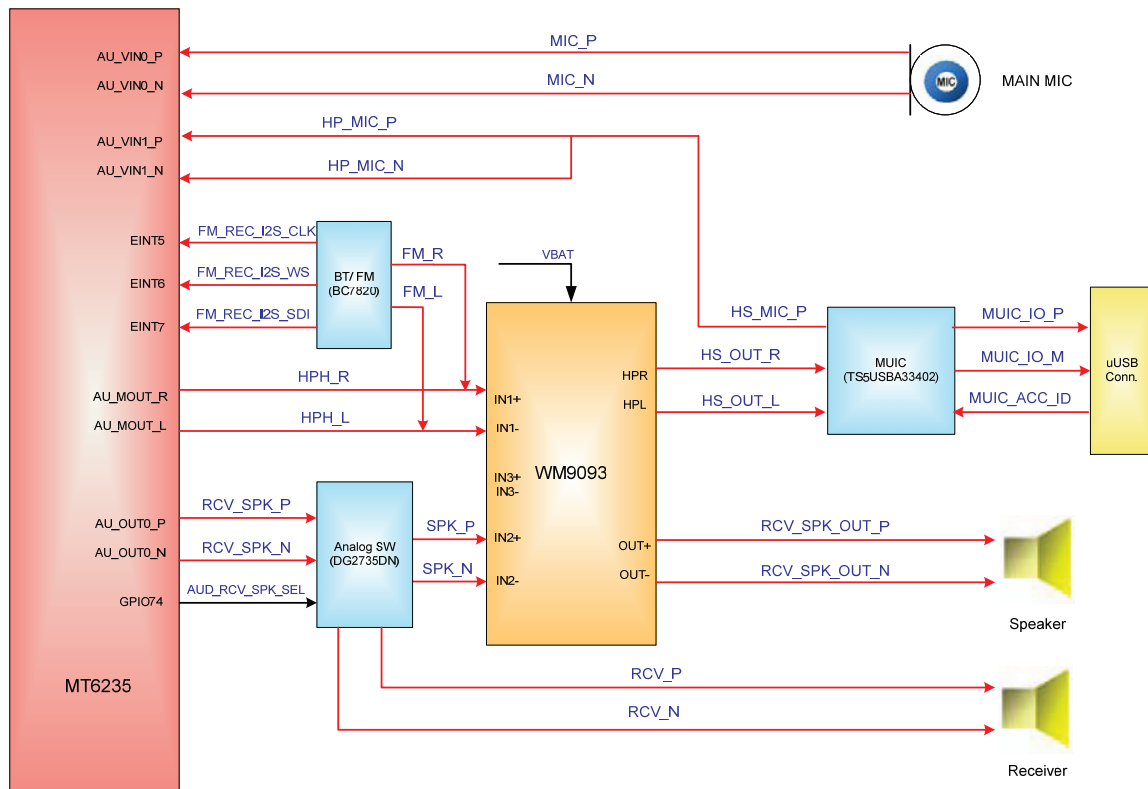


[Figure 3.15-1] Circuit Diagram

No	Name	Type	Description
1	GND	G	Ground
2	D7	O	Video luminance data7
3	D6	O	Video luminance data6
4	D5	O	Video luminance data5
5	D4	O	Video luminance data4
6	D3	O	Video luminance data3
7	D2	O	Video luminance data2
8	D1	O	Video luminance data1
9	D0	O	Video luminance data0
10	PCLK	O	Pixel clock output
11	RSTN	I	Sensor reset. Active "Low"
12	STBYN	I	Sensor sleep mode. Active "Low"
13	GND	G	Ground
14	VDDD	P	Digital power(1.8V)
15	VDDIO	P	I/O power(1.8V or 2.8V)
16	VDDA	P	Analog power (2.8V)
17	GND	G	Ground
18	MCLK	I	System Main Clock
19	HSYNC	O	Horizontal line synchronizations signal
20	VSYNC	O	Frame line synchronizations signal
21	GND	G	Ground
22	SDA	I/O	I2C standard data I/O port
23	SCL	I	I2C standard clock input
24	GND	G	Ground

## 3.16 Audio

LG-S310 Audio Part Block diagram is below

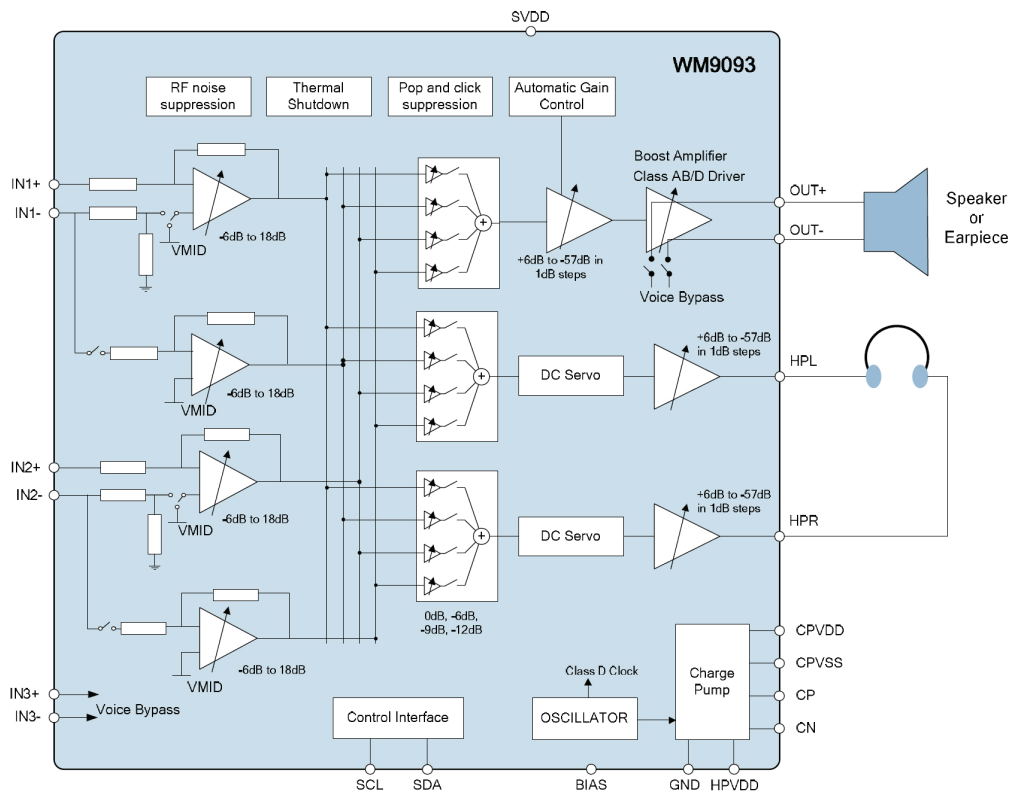


[Figure 3.16-2] Block Diagram

### 3. TECHNICAL BRIEF

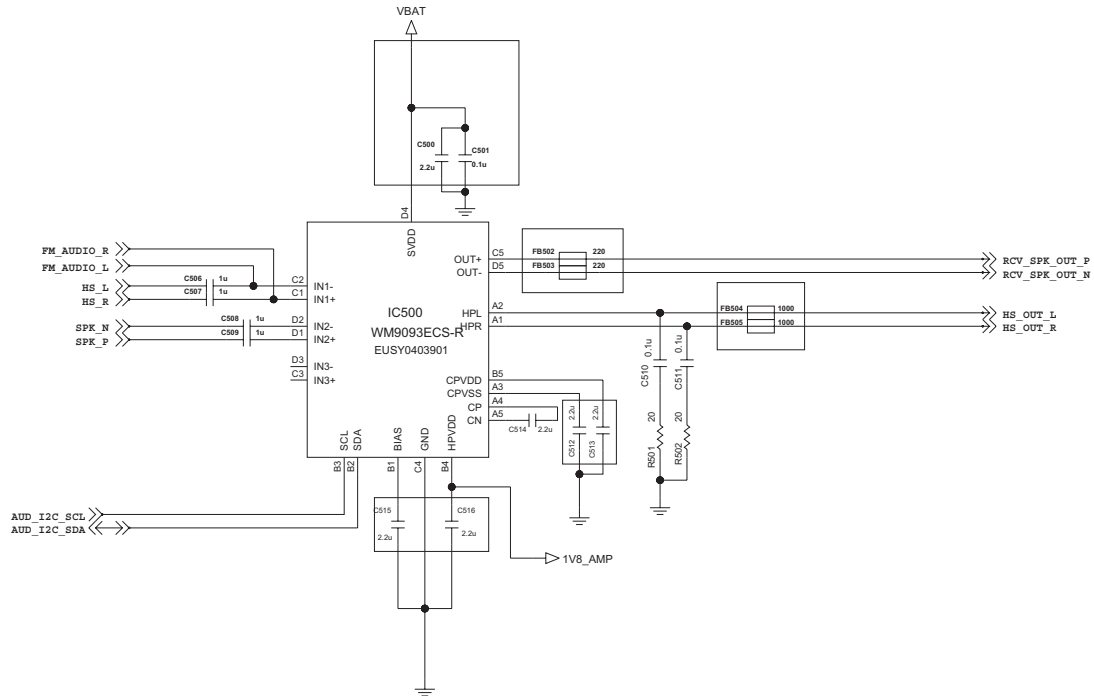
#### 3.16.1 Audio AMP(WM9093)

The WM9093 is a high performance low power audio subsystem, including headphone driver and Class AB/D earpiece/speaker driver. The Class D speaker driver supports 650mW output power at 3.6V, 1%THD. The unique dual mode charge pump architecture provides ground referenced headphone outputs removing the requirement for external coupling capacitors. Class G technology is integrated to increase the efficiency and extend playback time by optimizing the headphone driver supply voltages according to the volume control. The flexible input configuration allows single ended or differential stereo inputs. Mixers allow highly flexible routing to the outputs. A 'Voice Bypass' path is also available for low-power voice applications. The WM9093 is controlled using a two-wire I2C interface. An integrated oscillator generates all internal clocks, removing the need to provide any external clock. Separate mixer and volume controls are provided for each headphone and speaker driver. Automatic Gain Control limits the speaker output signal in order to prevent clipping. DC offset correction to less than 1mV guarantees a pop/click-free headphone start up.

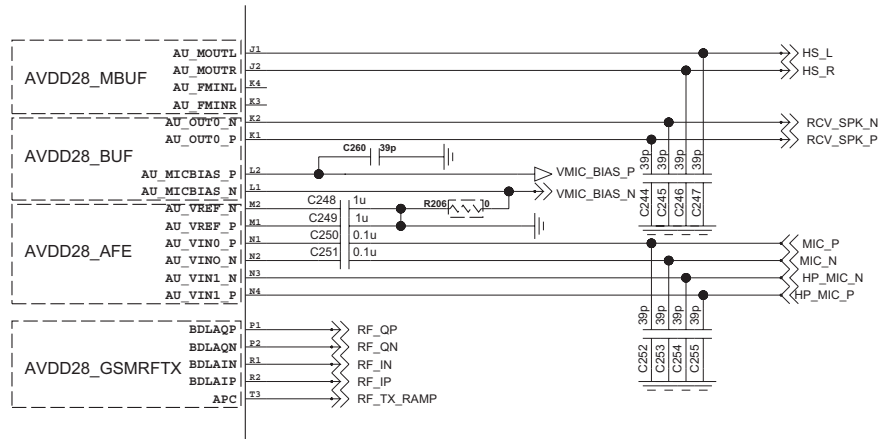


[Figure 3.16.1-1] Block Diagram

### 3. TECHNICAL BRIEF

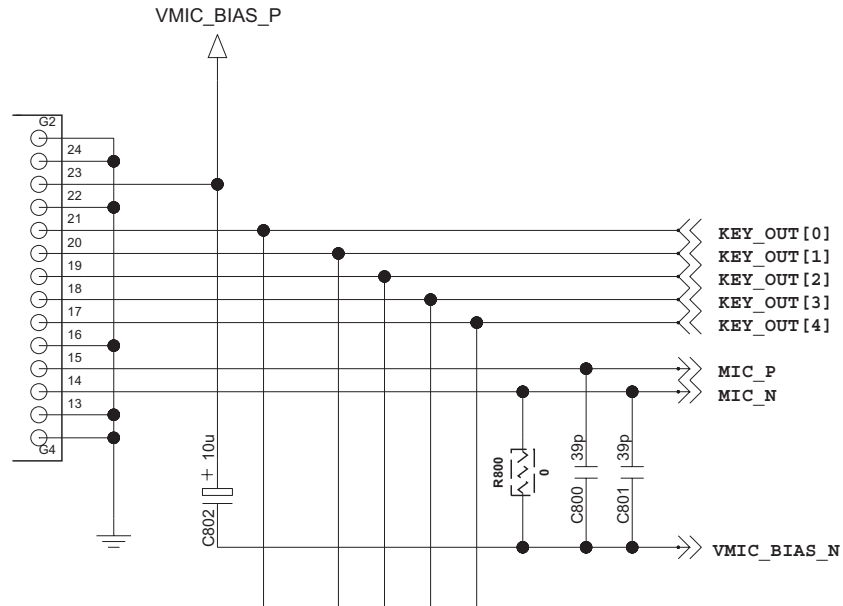
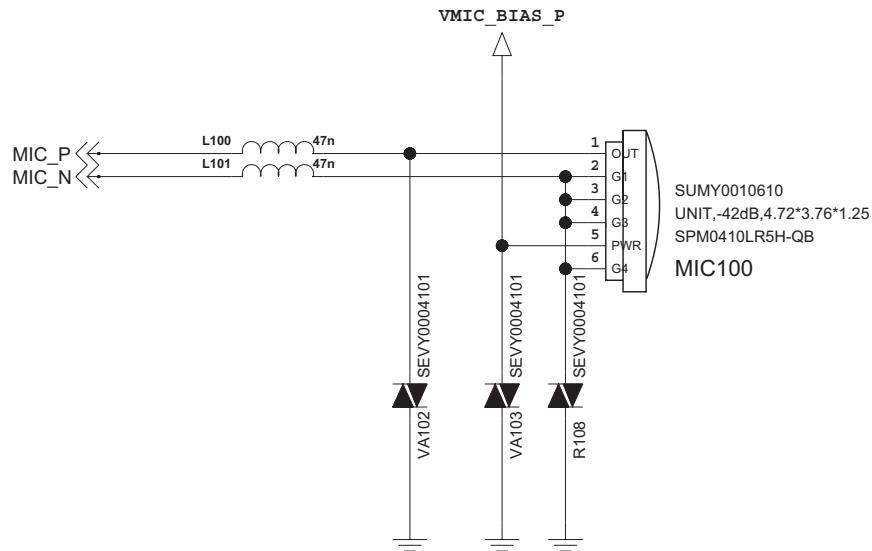


[Figure 3.16.1-2] Circuit Diagram

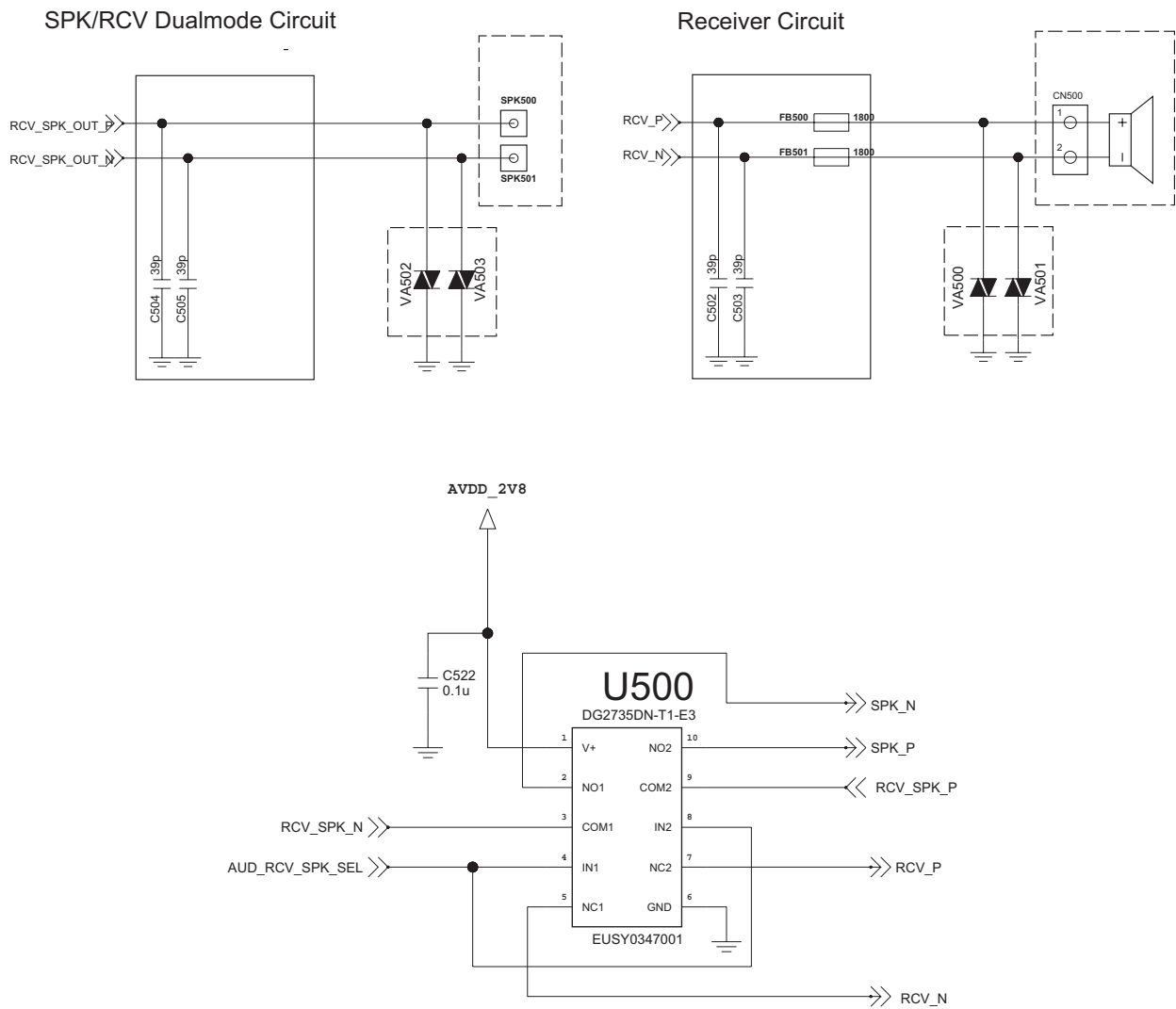


### 3. TECHNICAL BRIEF

#### 3.16.2 MIC Circuit

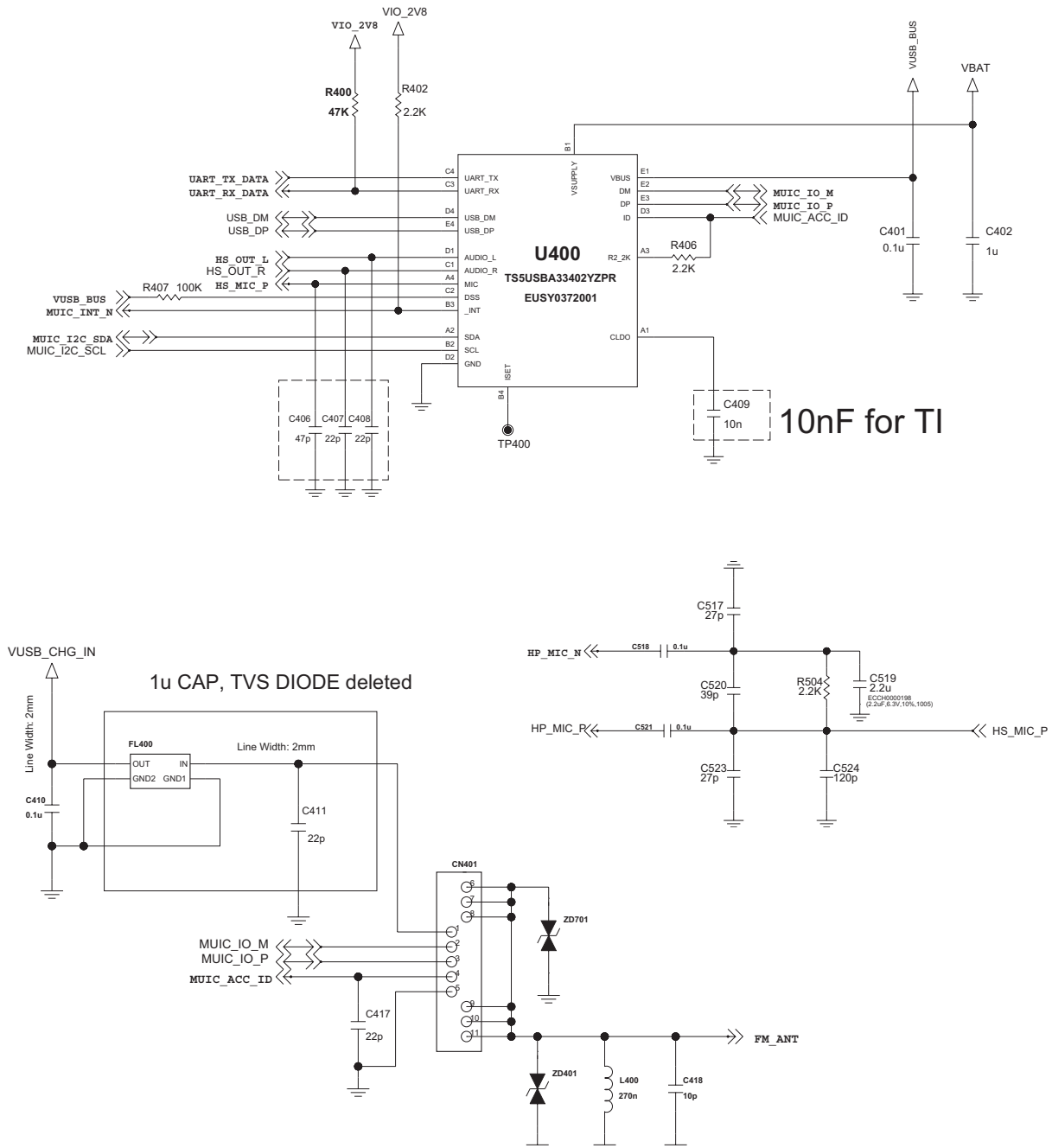


## 3.16.3 Speaker, Receiver Circuit



### 3. TECHNICAL BRIEF

#### 3.16.4 Headset Circuit



### 3.17 Bluetooth/FM (WYSBNBGX6)

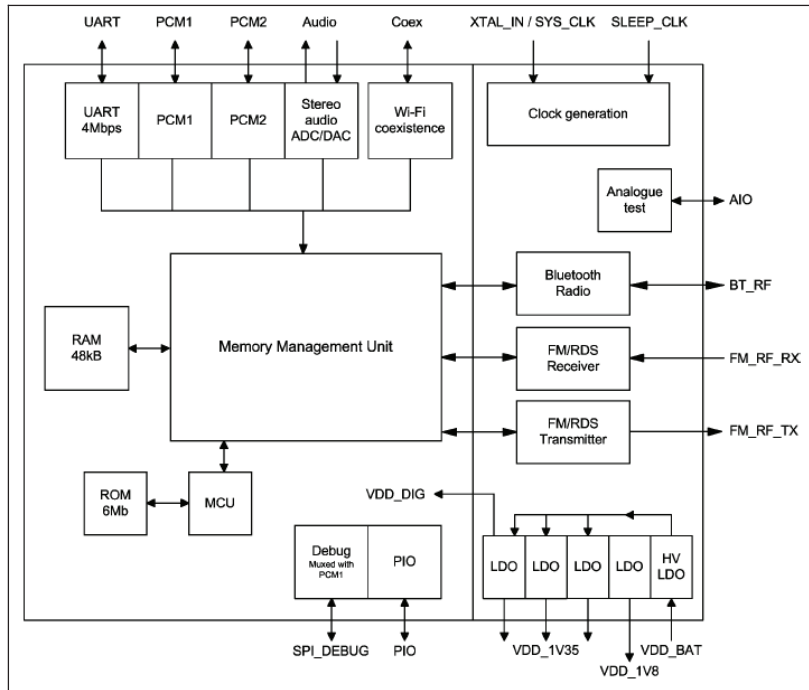
#### 3.17.1 General Description

The BC7820 is a product from CSR's Connectivity Centre. It is a single-chip radio and baseband IC for Bluetooth 2.4GHz systems including EDR to 3Mbps/s. It includes an integrated FM transmitter and receiver with stereo audio input and output stages and RDS modulator/demodulator. With the on-chip CSR Bluetooth software stack, it provides a system fully qualified to the Bluetooth v2.1 + EDR specification for data and voice communications.

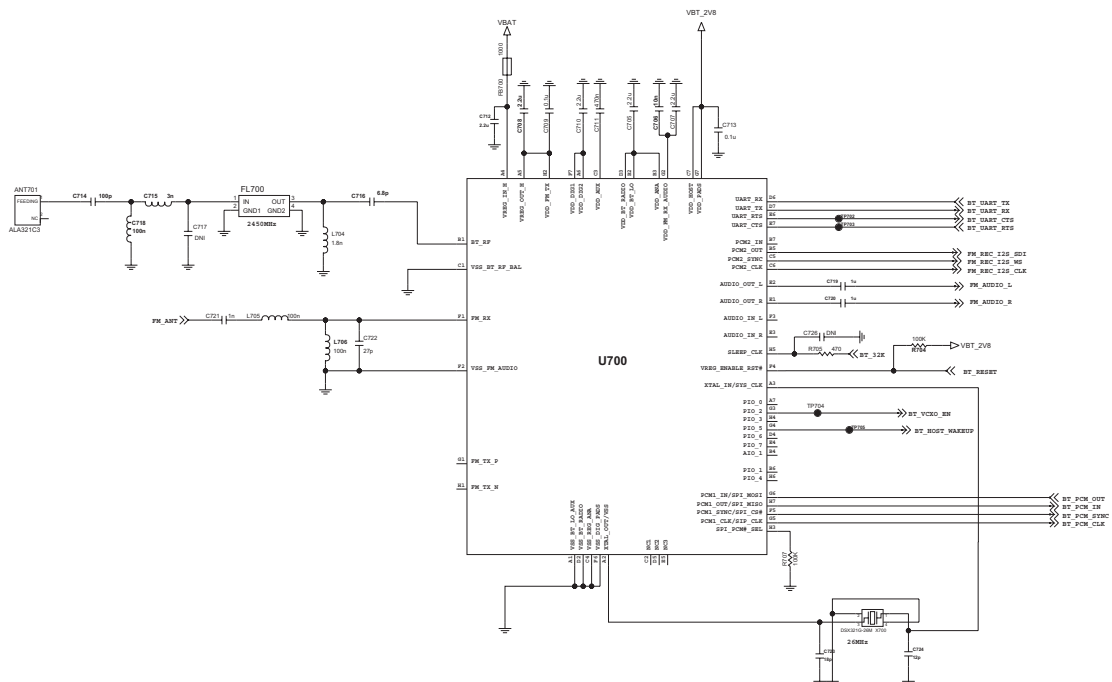
#### 3.17.2 Features

- BC7820 can be used as part of a fully compliant Bluetooth® v3.0 + HS system
- Fully qualified Bluetooth v2.1 + EDR system
- Integrated FM radio receiver and transmitter with full RDS/RBDS encoding and decoding, -including support for TMC encoding and decoding
- Stereo audio input and output stages
- Full-speed Bluetooth operation with full piconet support
- Scatternet support
- 16-bit AuriStream® (ADPCM) codec
- Low-power selectable 1.2 to 3.6V I/O
- Integrated digital core and analogue regulators
- High-speed UART port (up to 4Mbps)
- 0.4mm pitch WLCSP - no underfill required
- Support for 802®.11 coexistence
- Green (RoHS and no antimony or halogenated flame retardants)
- On-chip balun

### 3. TECHNICAL BRIEF



[Figure 3.17-1] Functional Block Diagram



[Figure 3.17-2] Circuit Diagram

### 3.17.3 Transmitter

#### - IQ Modulator

The transmitter features a direct IQ modulator to minimize the frequency drift during a transmit timeslot, which results in a controlled modulation index. Digital baseband transmit circuitry provides the required spectral shaping.

#### - Power Amplifier

The internal PA output power is software controlled and configured through a PS Key. This enables BC7820 to be used in Class 1, Class 2, and Class 3 Bluetooth radios without an external RF PA.

### 3.17.4 Receiver

The receiver features a near-zero IF architecture that allows the channel filters to be integrated onto the die. Sufficient out-of-band blocking specification at the LNA input allows the receiver to be used in close proximity to GSM and WCDMA cellular phone transmitters without being desensitized. For both basic rate and EDR, an ADC is used to digitize the IF received signal.

#### - Low Noise Amplifier

The LNA operates in differential mode and takes its input from the balanced port of the on-chip balun.

#### - RSSI Analogue to Digital Converter

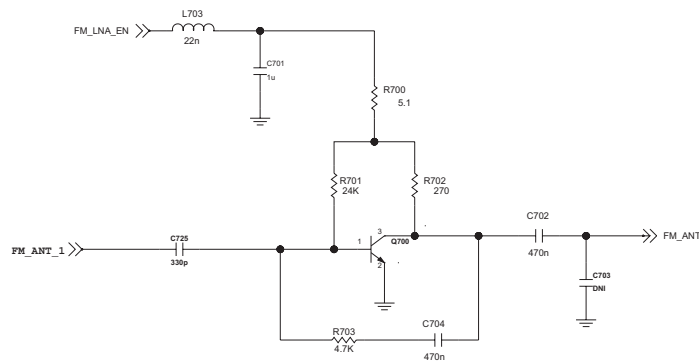
The ADC implements fast AGC. The ADC samples the RSSI voltage on a slot-by-slot basis. The front-end LNA gain is changed according to the measured RSSI value, keeping the mixer input signal within a limited range. This improves the dynamic range of the receiver, so improving performance in interference limited environments.

### 3. TECHNICAL BRIEF

#### 3.17.5 FM External LNA

- Features

- . Epitaxial Planar NPN Transistor
- . Low Noise Figure, High Gain
- . NF=1.1dB,

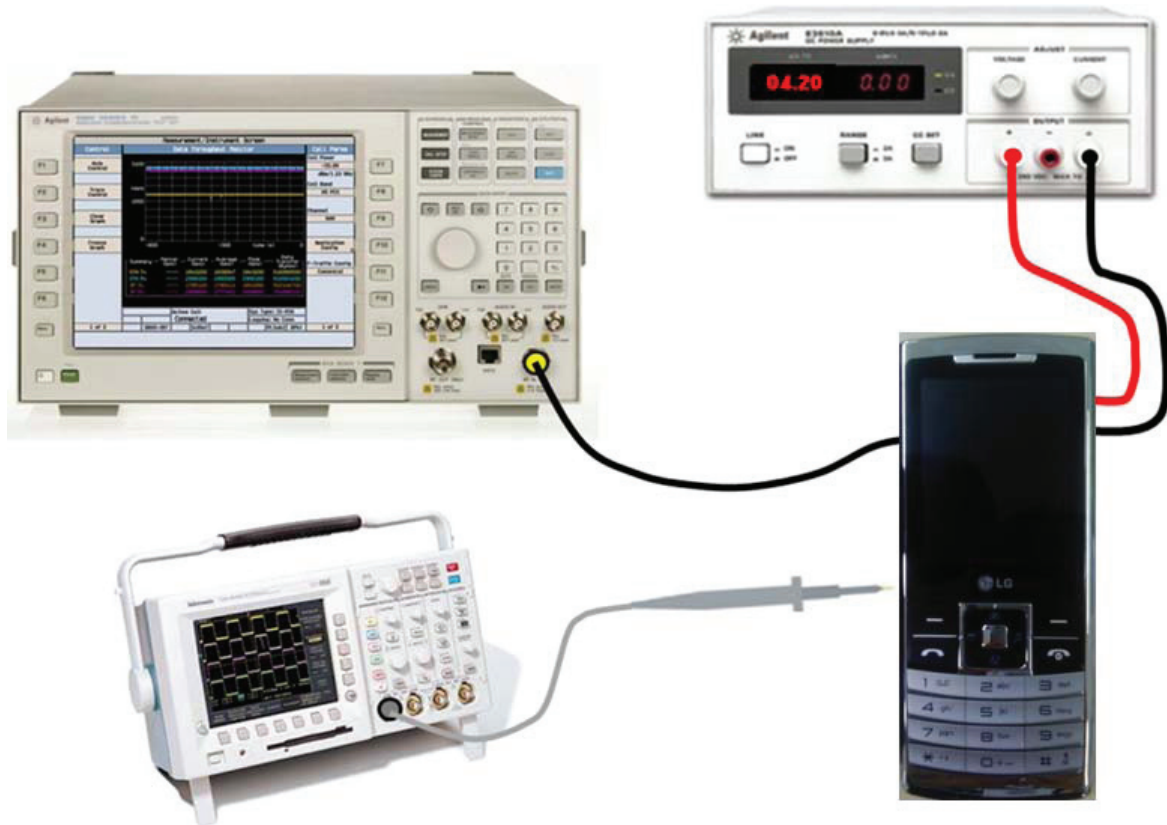


[Figure 3.17.5] FM LNA Circuit diagram

FM LNA Circuit is designed to improve the FM sensitivity in the FM antenna built in phone. It has collector-feedback bias to minimize the temperature effect. FM\_LNA\_EN turn on it while FM function is working without plugging Ear jack.

## 4. TROUBLE SHOOTING

## 4.1 Trouble shooting test setup



## Equipment setup

Power on all of test equipment

- Connect PIF-UNION JIG or dummy battery to the DUT for power up.
- Connect mobile switch cable between Communication test set and DUT when you need to make a phone call.
- Follow trouble shooting procedure

## 4. TROUBLE SHOOTING

### 4.2 Power on trouble

#### Power On sequence is :

END key press -> MT6235 PWRKEY pin goes to low -> MT6235 Power Up -> Vcore\_1V2(C238)  
->VIO\_2V8(C232), VMEM\_1V8(C236), AVDD\_2V8(C237), power up and system reset assert to MT6235 ->  
Phone booting and PWRBB assert to MT6235

#### Check the LDOs power and X-tal

- Main board & main Key FPCB Connector(TP1)
- END\_KEY Signal (TP2)
- VCORE\_1V2 (TP3), VIO\_2V8(TP4), VMEM\_1V8(TP5), AVDD\_2V8 (TP6)
- X-tal(TP7)

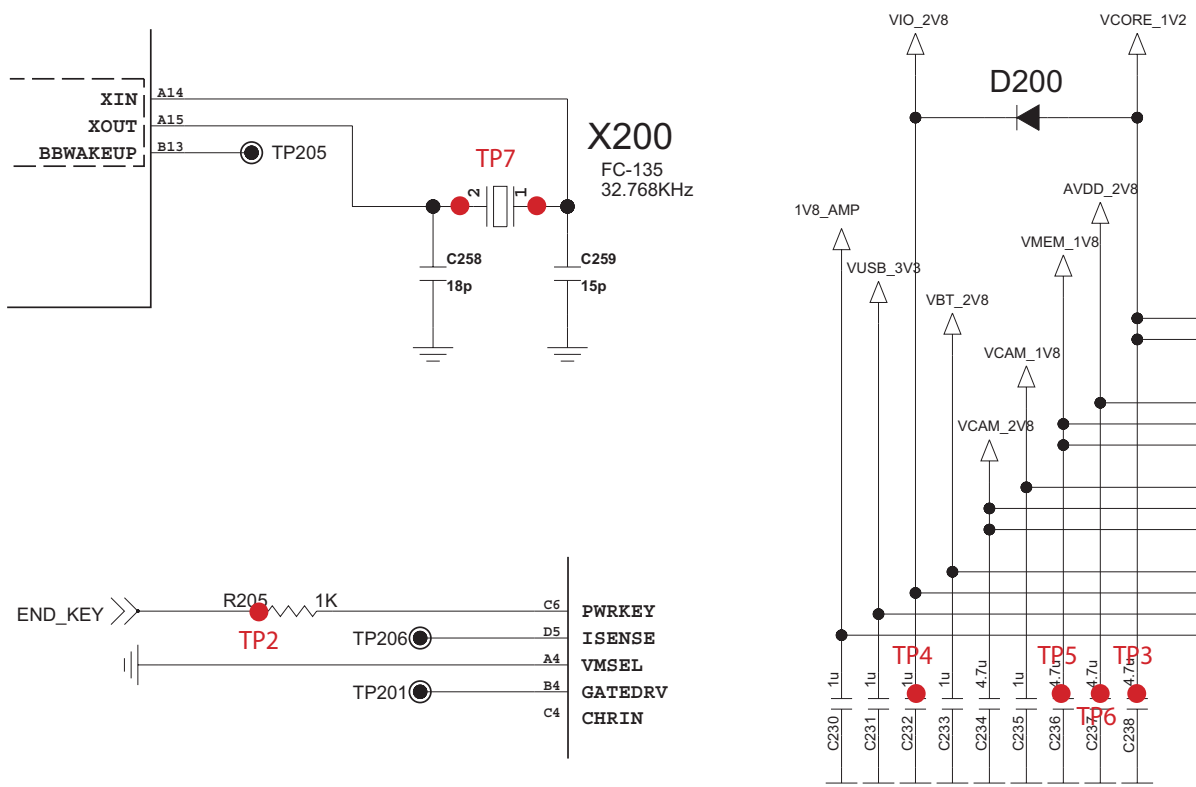
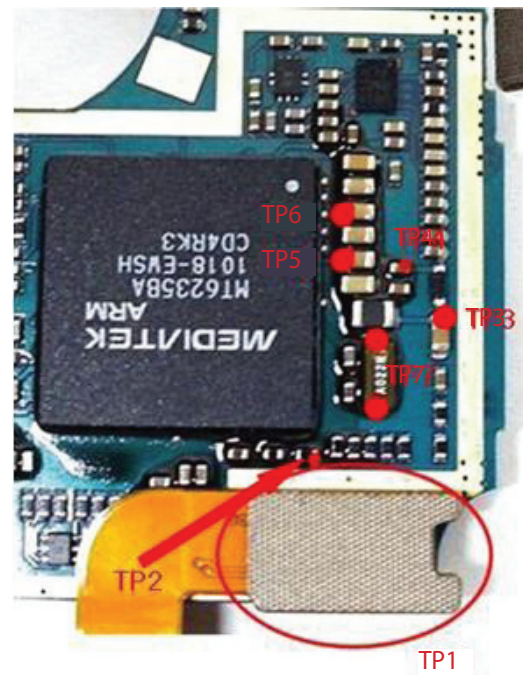
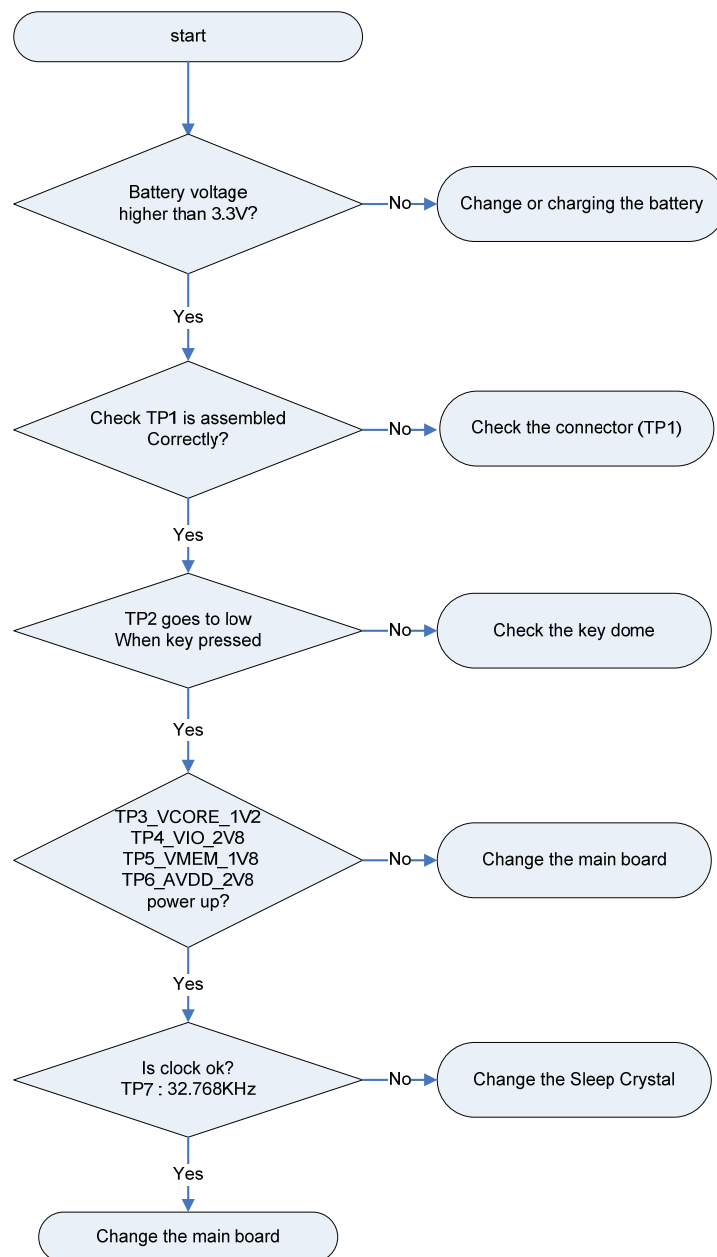


Figure 4.2.1 Power on trouble

### Checking Points and Flow



## 4. TROUBLE SHOOTING

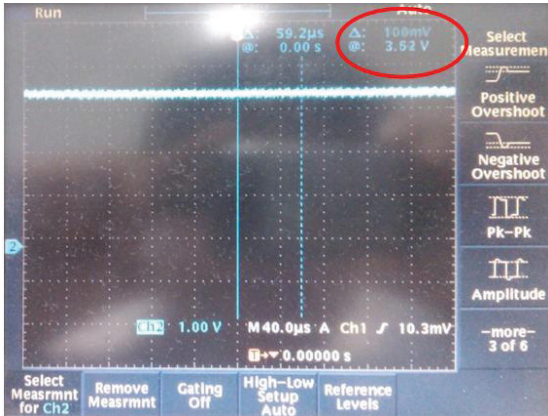


Figure 4.2.2 END KEY(TP2) High (before booting) & Low (booting)

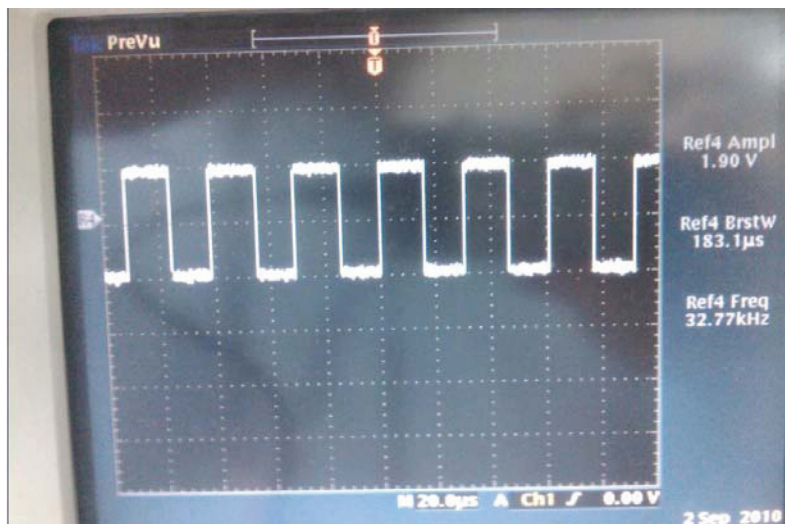


Figure 4.2.3 X-tal (TP7) Wave Form (32.768kHz)

### 4.3 Charging Trouble

#### 🔧 Charging Procedure

- Connect TA and battery to the phone
- Control the charging current by Single Charger
- Charging current flows into the battery

#### 🔧 Check Point

- Connection of TA or USB Cable
- Charging current path
- Battery

#### 🔧 Troubleshooting Setup

- Connect TA or USB Cable

#### 🔧 Troubleshooting Procedure

- Check the charger (TA or USB Cable) connector
- Check the charging current Path
- Check the battery

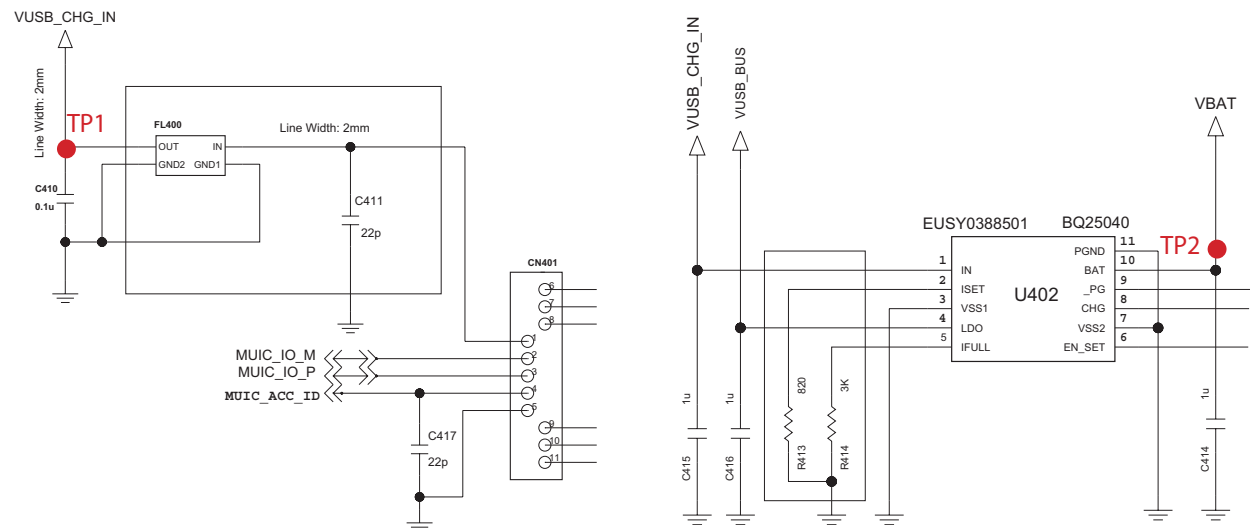
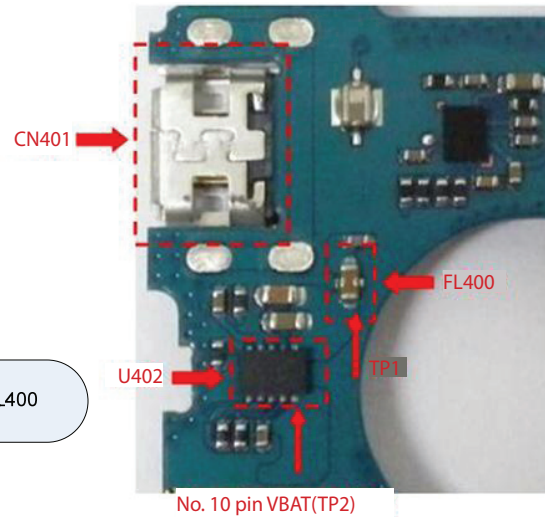
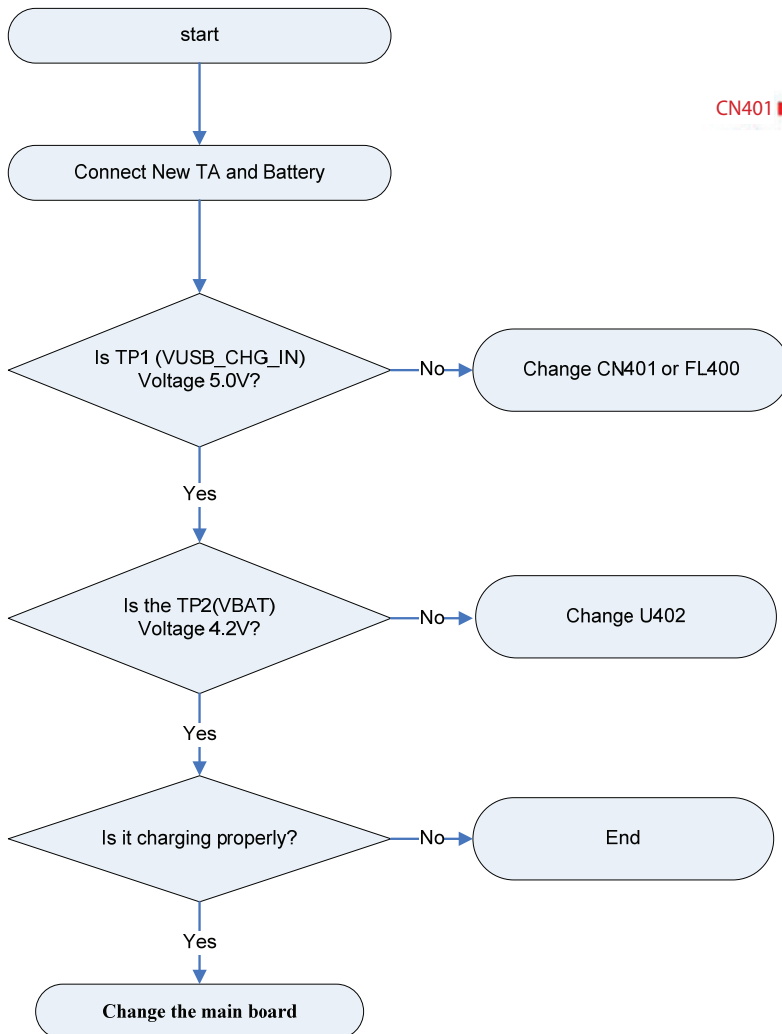


Figure 4.3.1 Charging circuit

## 4. TROUBLE SHOOTING

### Checking Points and Flow



### 4.4 USB Trouble

#### Check the USB power and signal

- VUSB\_CHG\_IN (TP1)
- VBAT (TP2)
- MUIC\_IO\_P (TP3) , MUIC\_IO\_M (TP4)

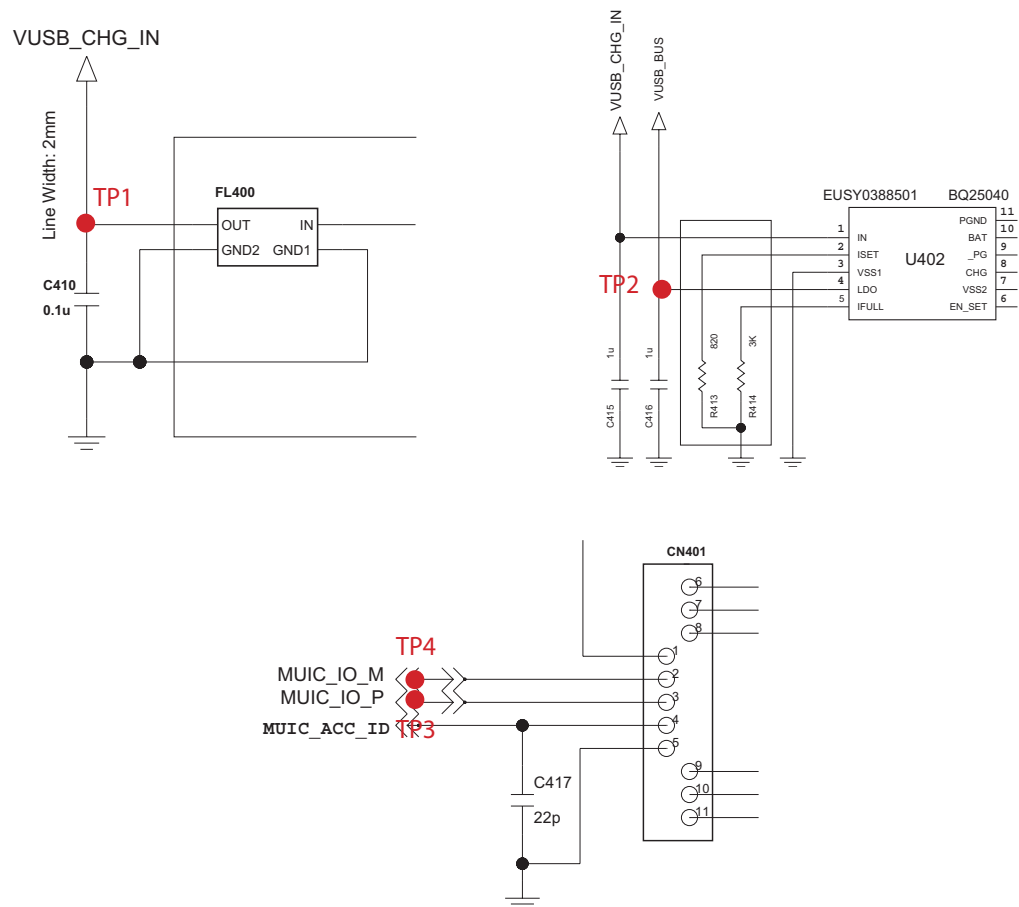
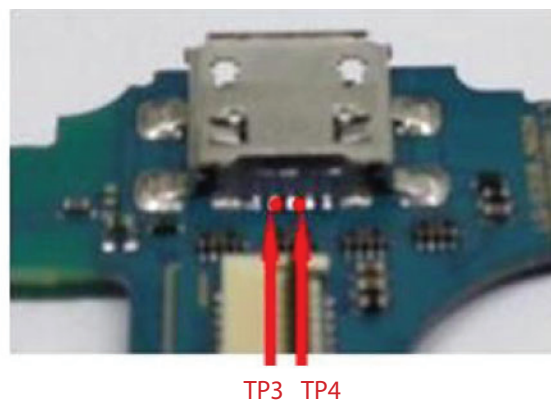
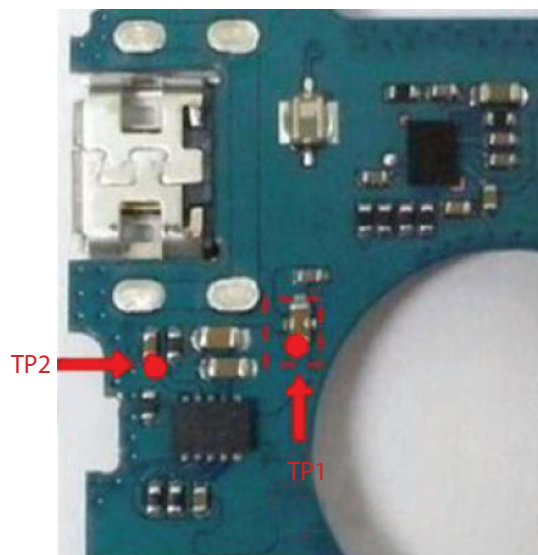


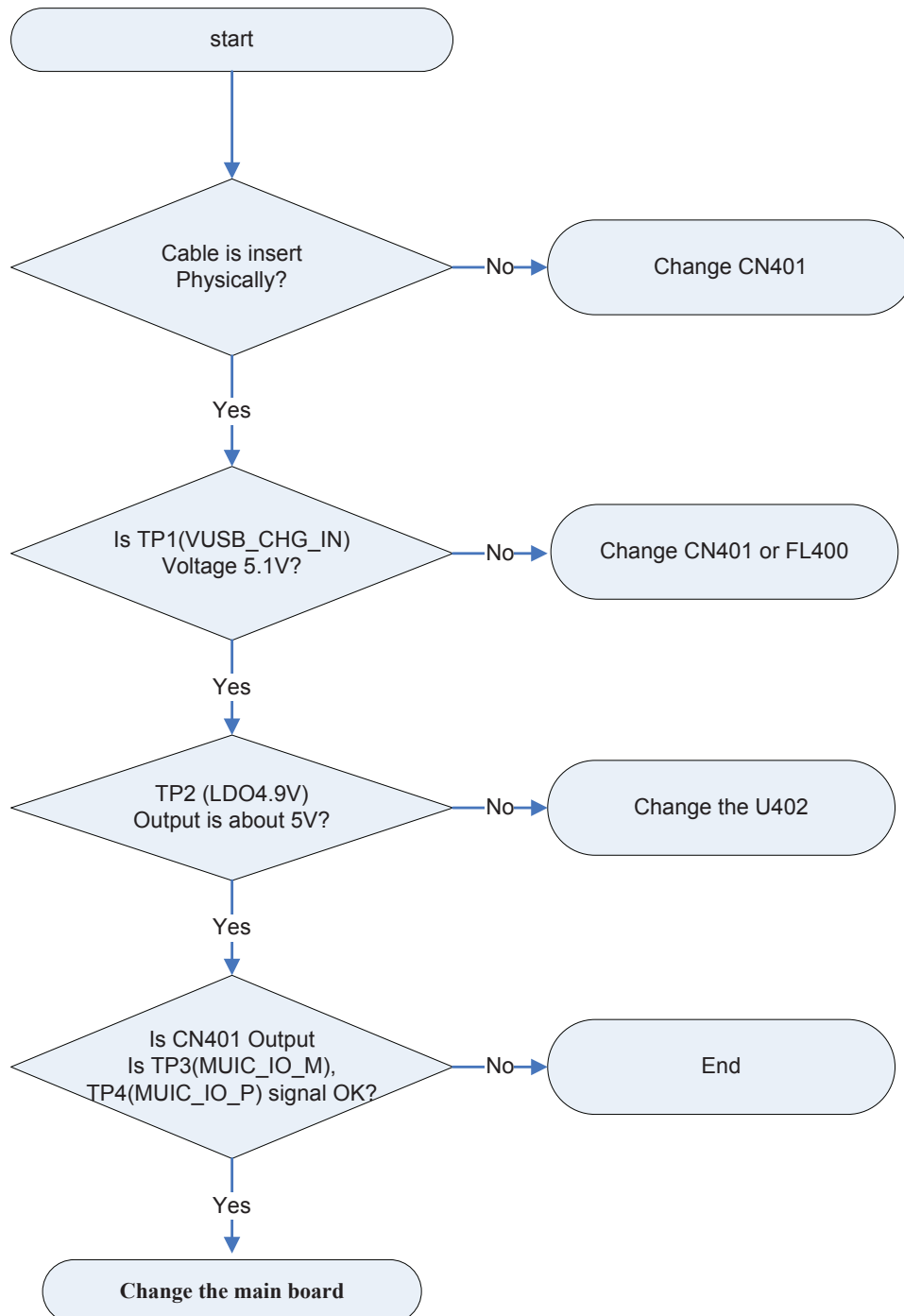
Figure 4.4.1 USB Circuit

## 4. TROUBLE SHOOTING

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### Checking Point and Flow





## 4. TROUBLE SHOOTING

### 4.5 SIM Detect Trouble

Check the SIM power and signal

-VSIM\_PWR (TP1)

-SIM\_RST\_N (TP2), SIM\_CLK (TP3), SIM\_DATA (TP4)

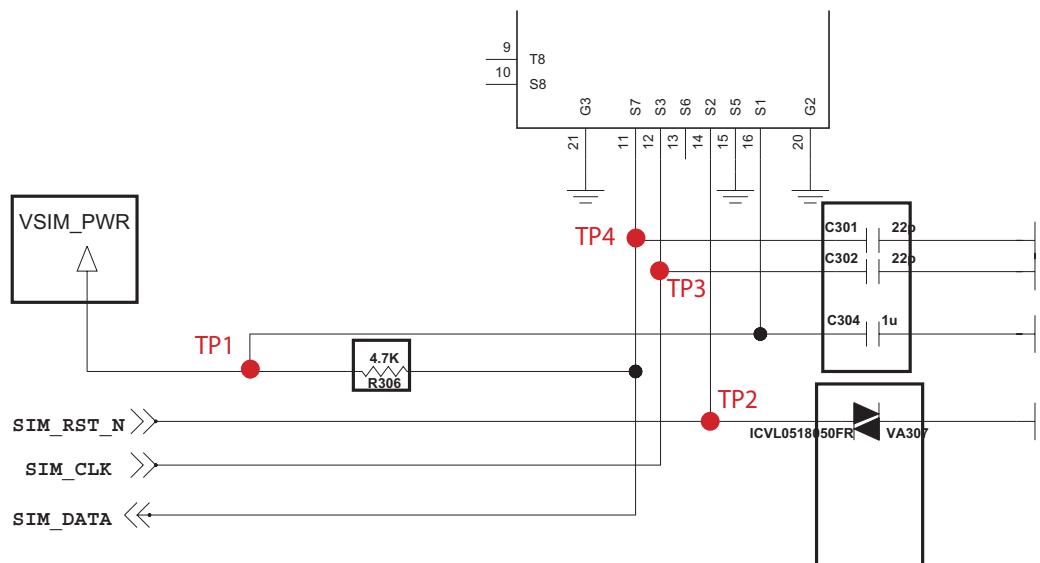
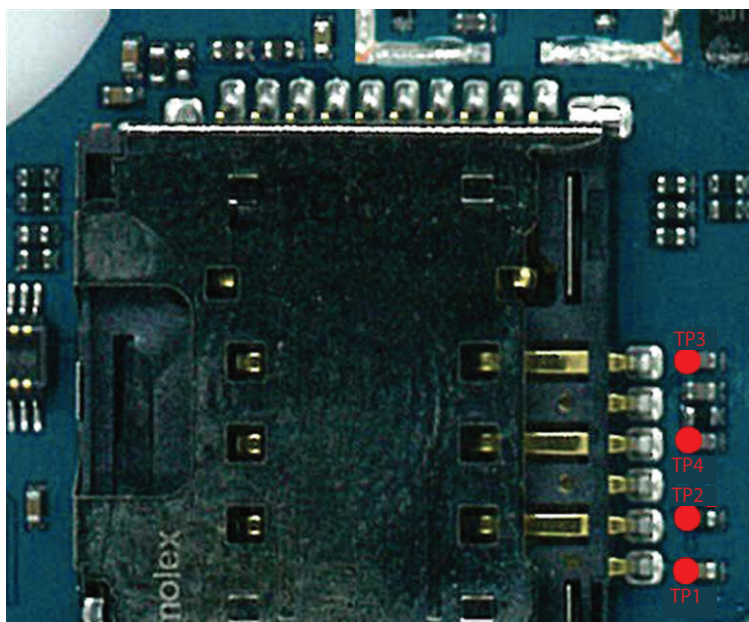
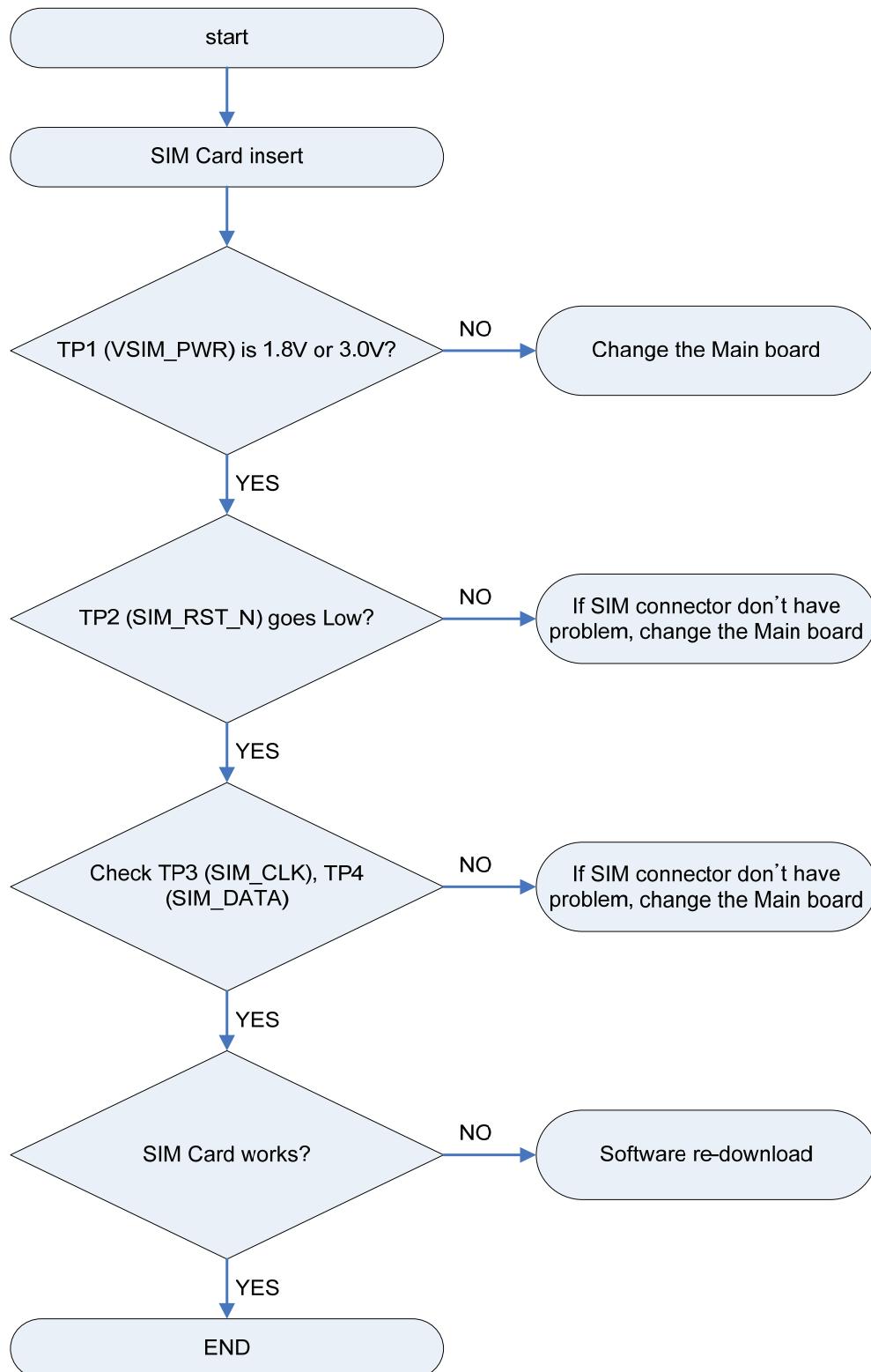


Figure 4.5.1 SIM Circuit

#### Checking Point



### Checking Flow



## 4. TROUBLE SHOOTING

### 4.6 Key Sense Trouble

Check the un-recognized KEY\_IN and KEY\_OUT

-KEY\_IN0~5 (TP1~6)

-KEY\_OUT0~4 (TP7~11)

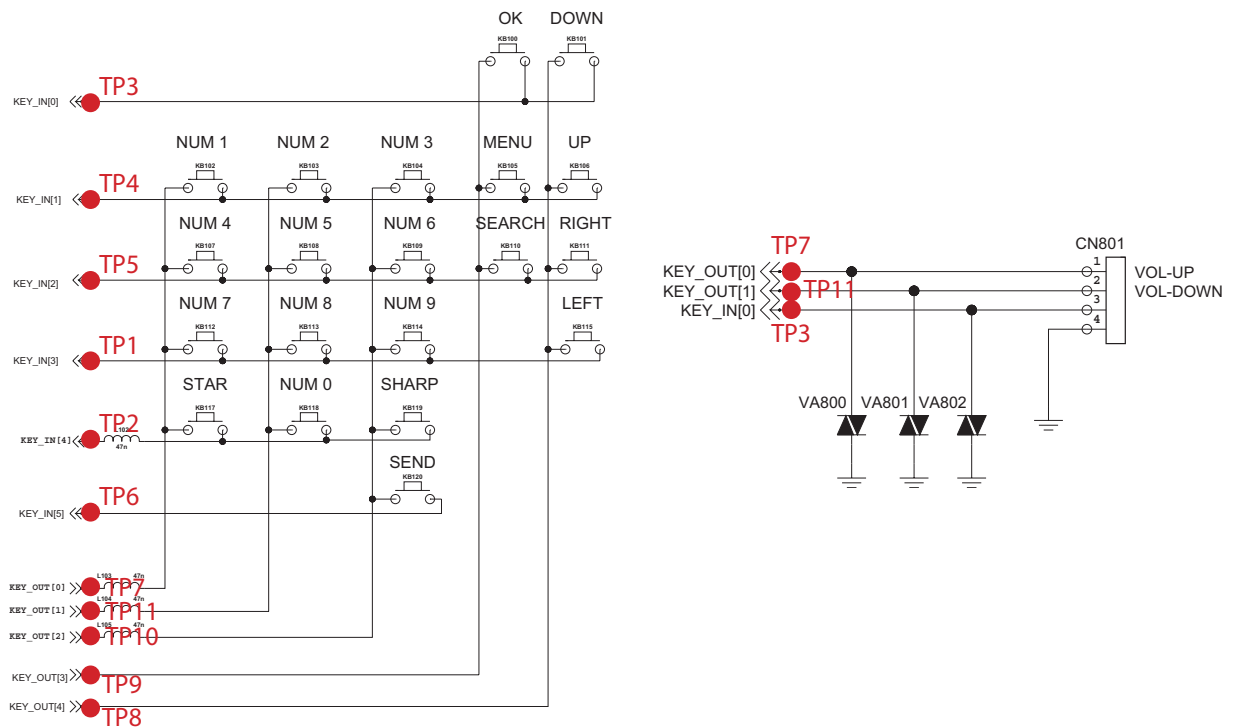
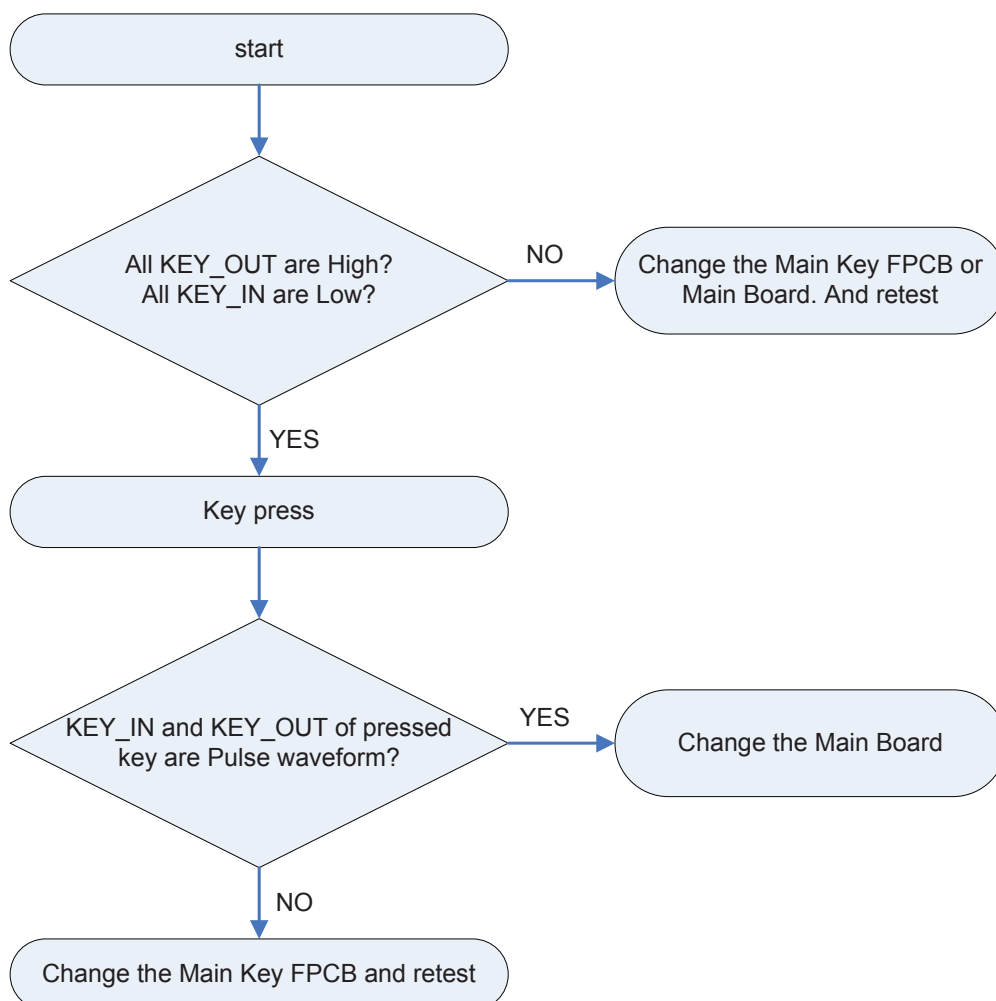
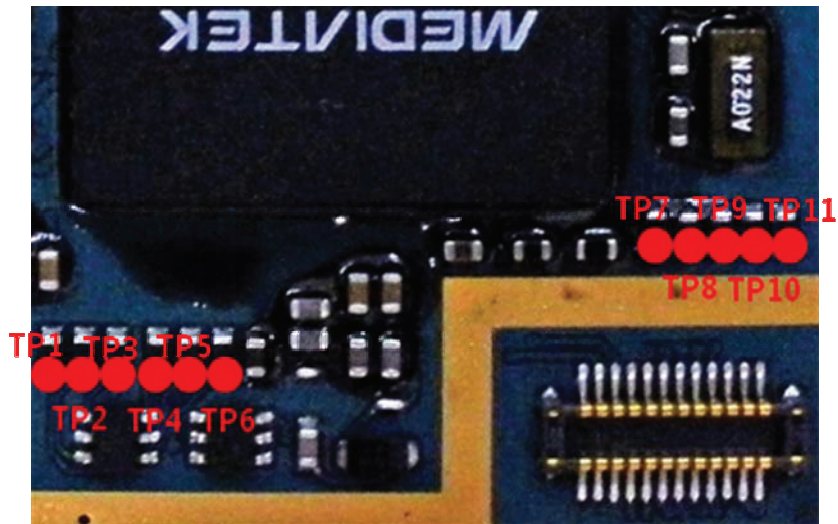


Figure 4.6.1 Key Sense Circuit

### Checking Points and Flow



## 4. TROUBLE SHOOTING

### Waveform

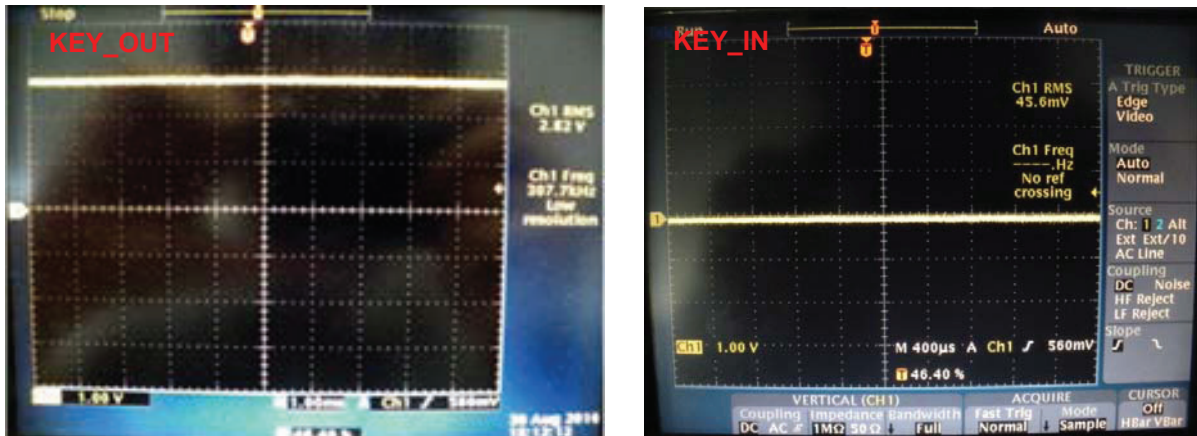


Figure 4.6.2 Before Key press

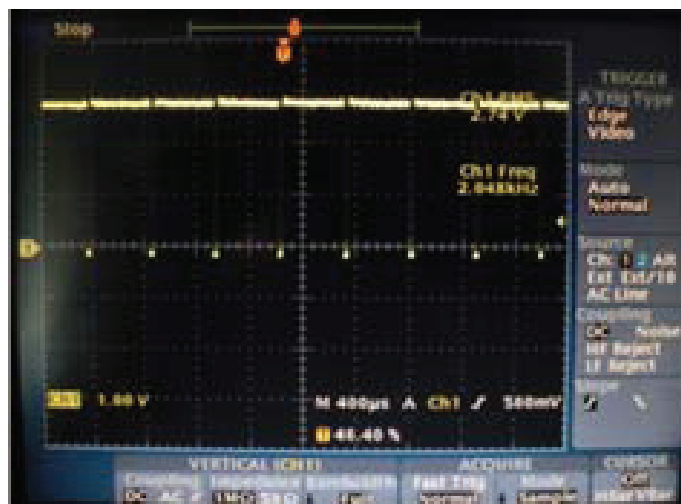


Figure 4.6.3 While Key press, KEY\_IN & KEY\_OUT waveform

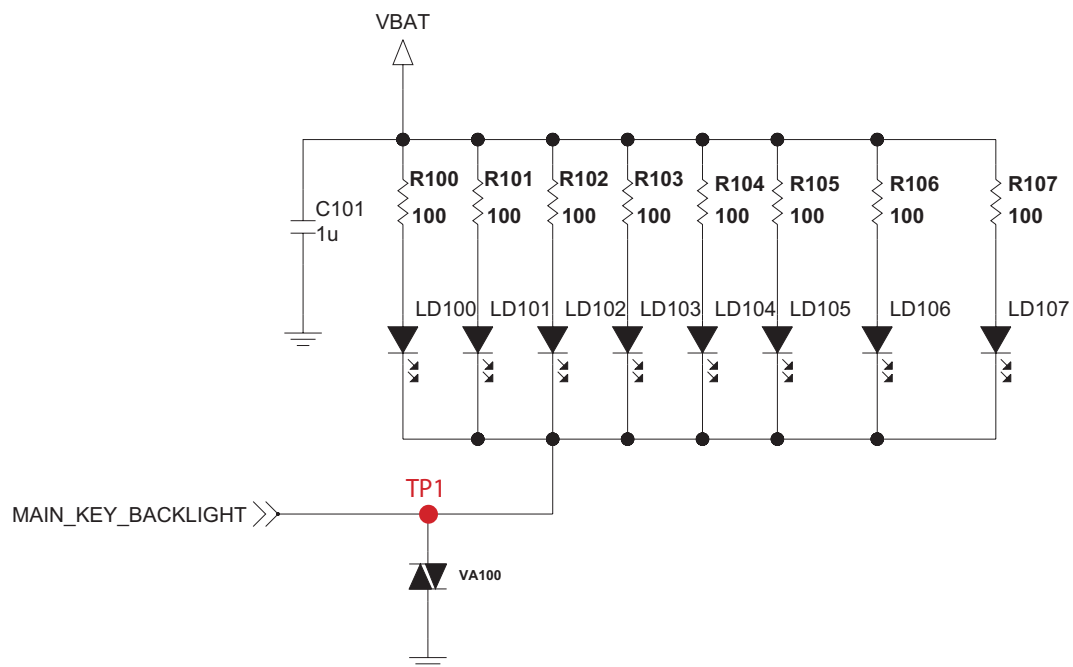
### 4.7 Keypad Backlight Trouble

**MAIN Key Pad LED is on as below :**

Key pressing -> main key backlight goes down low (below 0.8v) -> MAIN Key Backlight LED On

**Check the TP1 voltage**

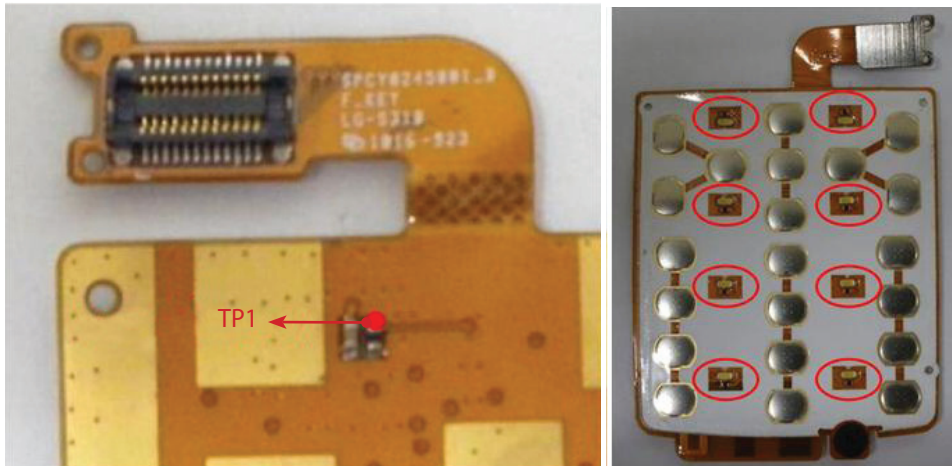
-TP1 = Above 0.8 V



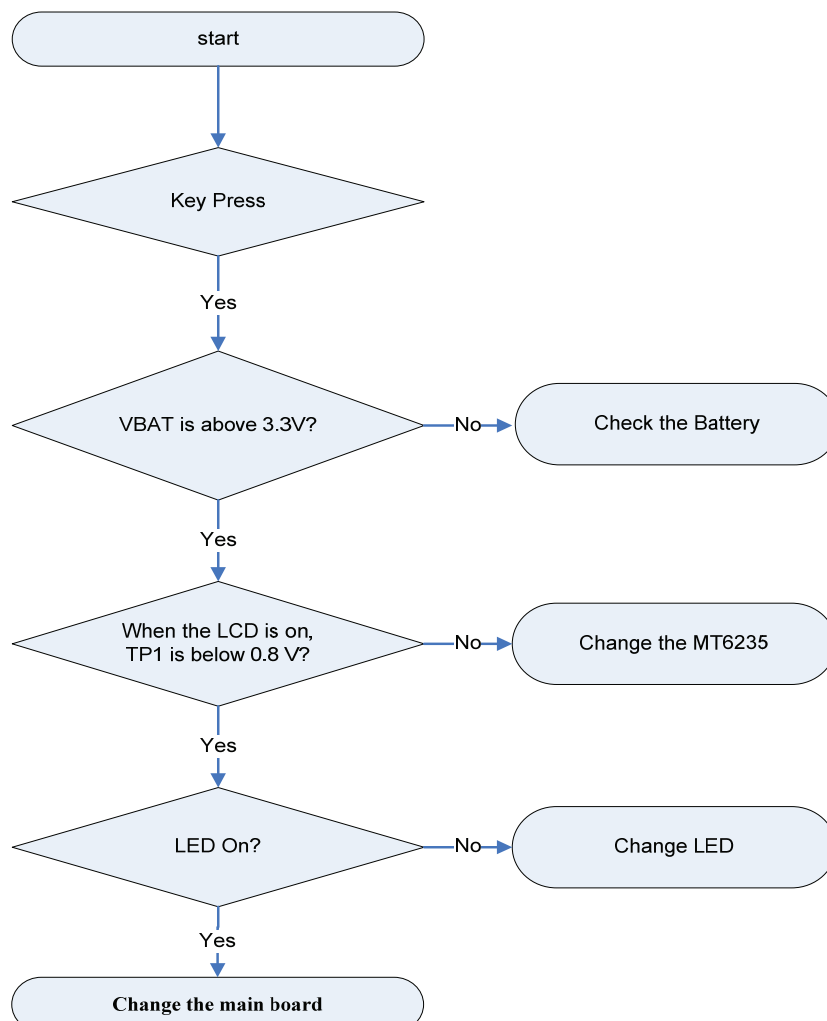
**Figure 4.7.1 Keypad Backlight Trouble Circuit**

## 4. TROUBLE SHOOTING

### Checking Point



### Checking Flow



### 4.8 Micro SD Trouble

#### Check the Micro SD power and signal

-VBL\_LDO\_2V8 (TP2), VIO\_2V8 (TP1)

-MSD\_DET\_N (TP3), MSD\_CLK (TP4), MSD\_CMD (TP5), MSD\_D[0]~[3] (TP6~9)

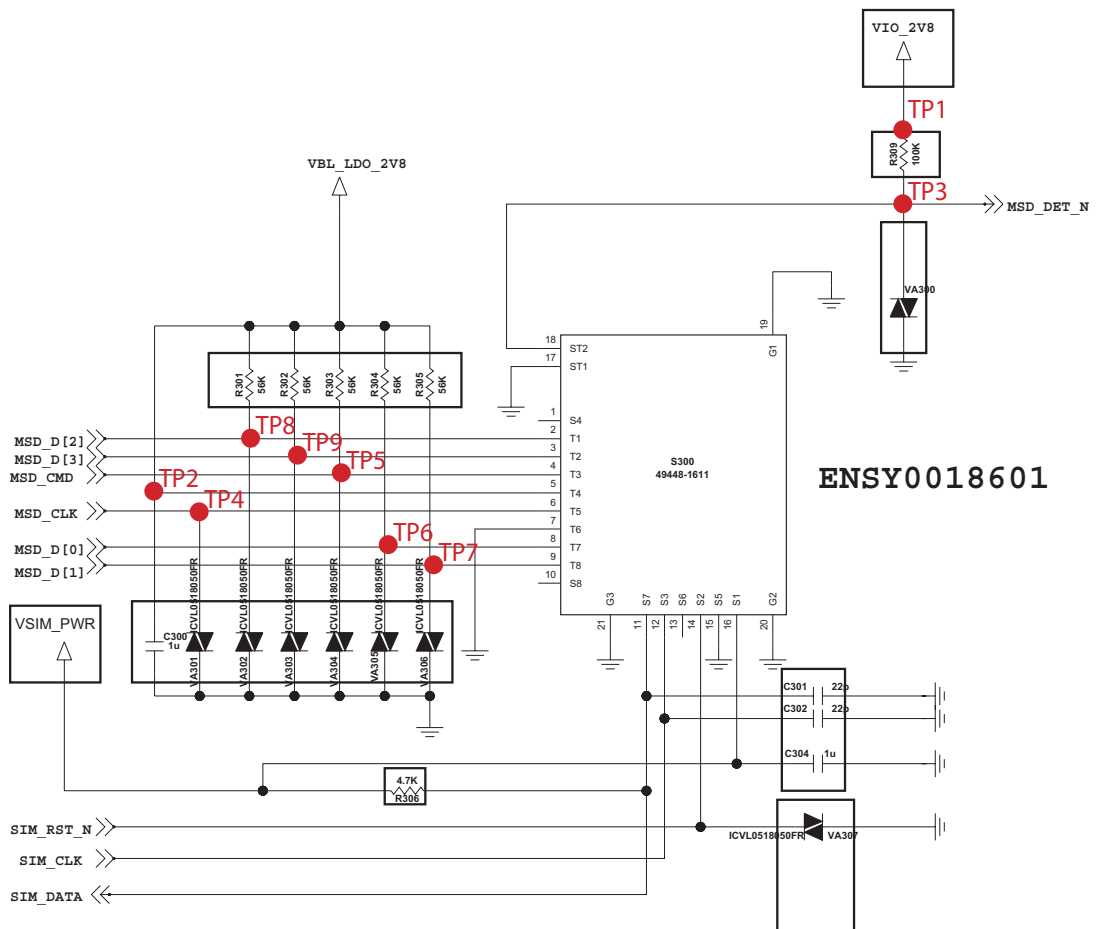
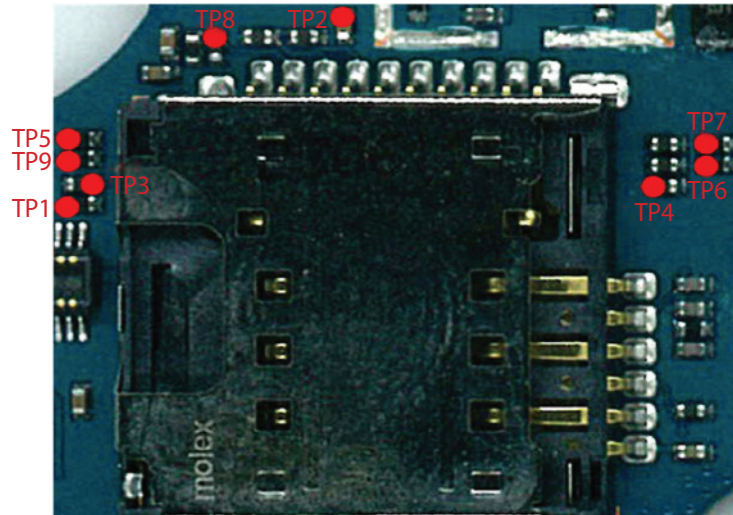


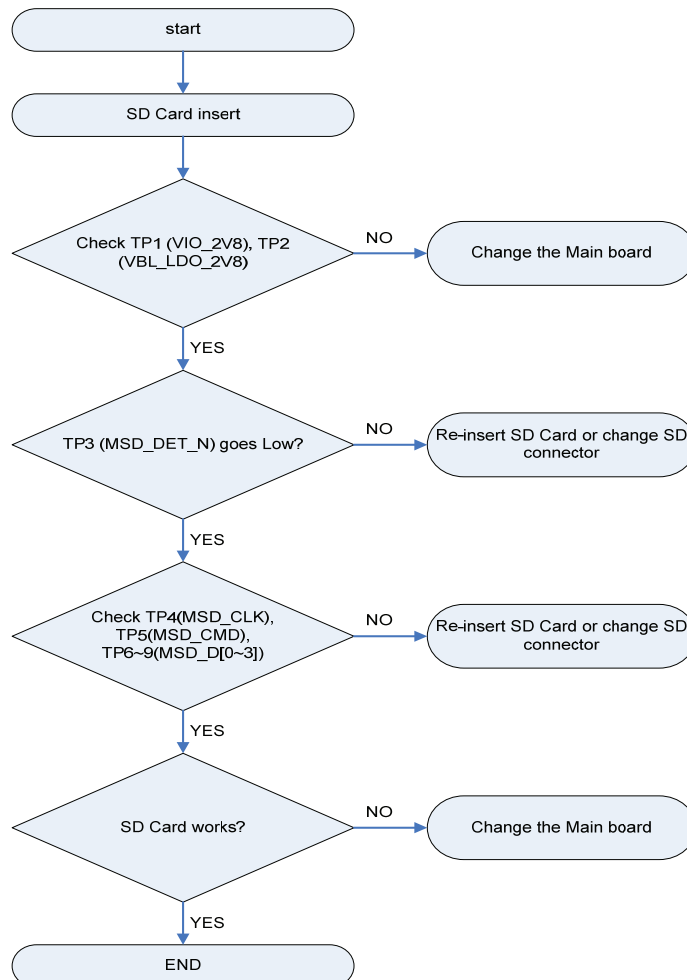
Figure 4.8.1 Micro SD Circuit

## 4. TROUBLE SHOOTING

### Checking Point



### Checking Flow



### Waveform

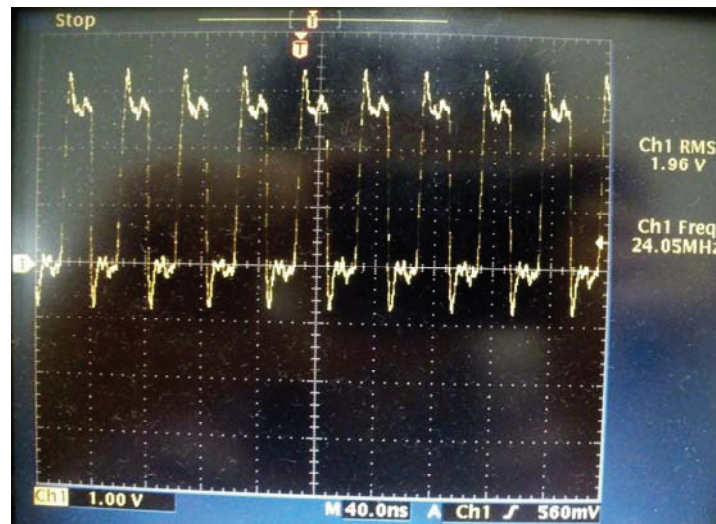


Figure 4.8.2 MSD\_CLK Signal Waveform

## 4. TROUBLE SHOOTING

### 4.9 Audio Trouble

#### 4.9.1 Receiver Trouble

Check the receiver signal path

-RCV\_P/ N (TP1~TP2)

-RCV\_SPK\_P/N (TP3~TP4)

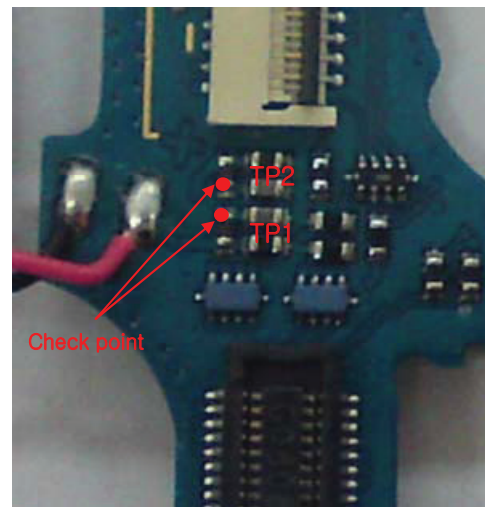
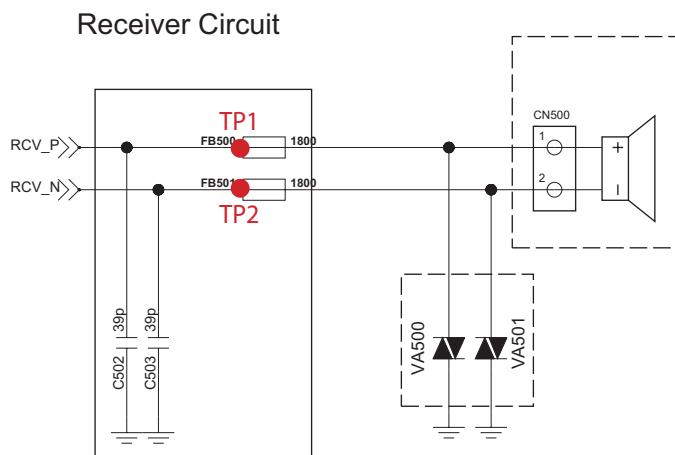
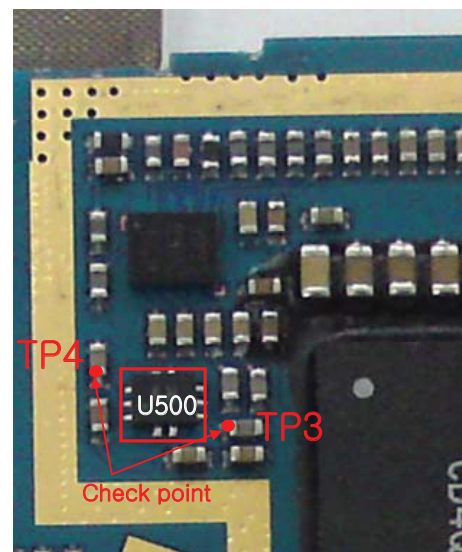
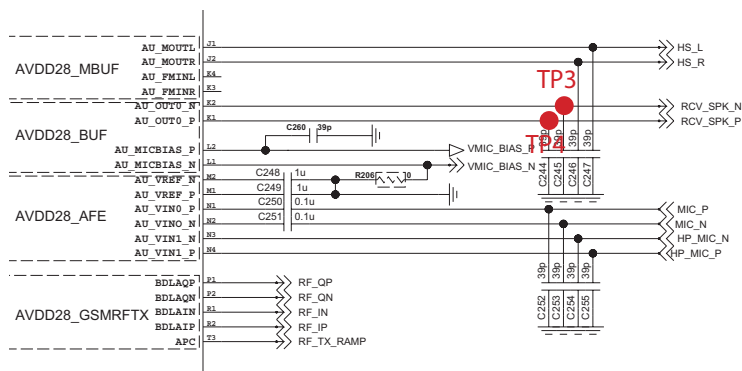
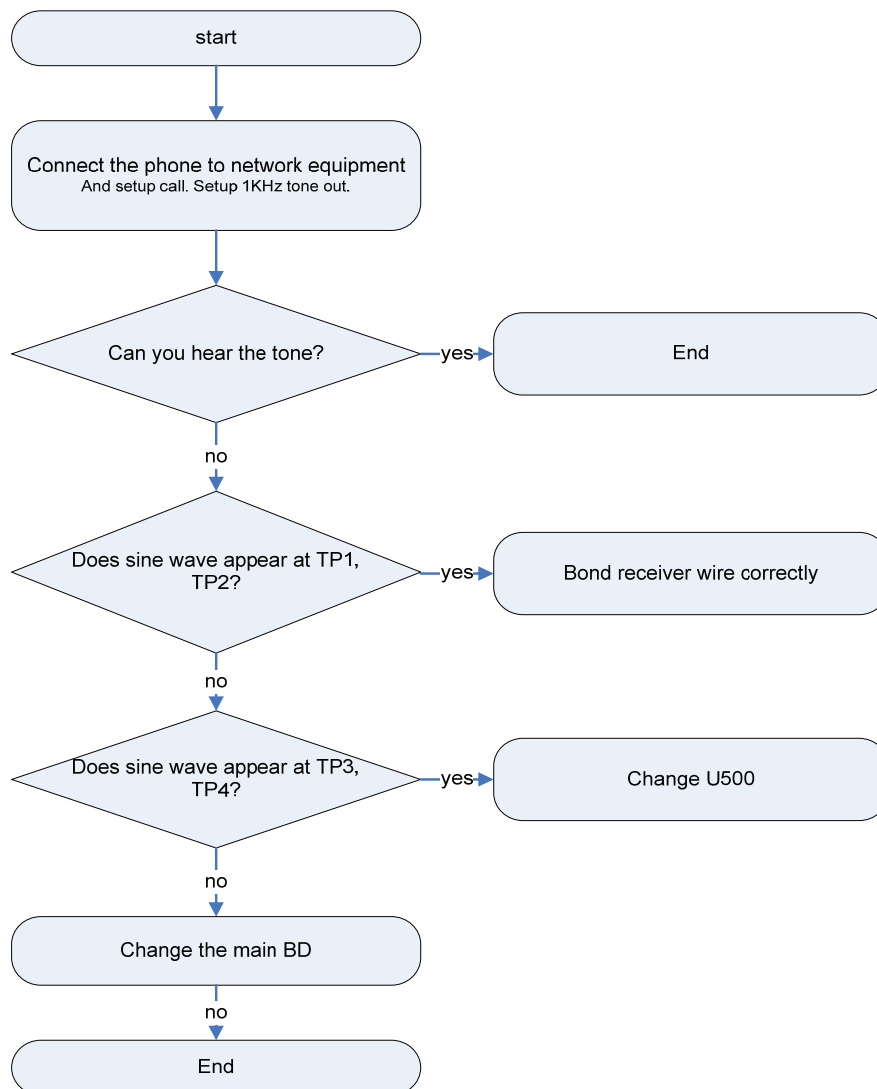


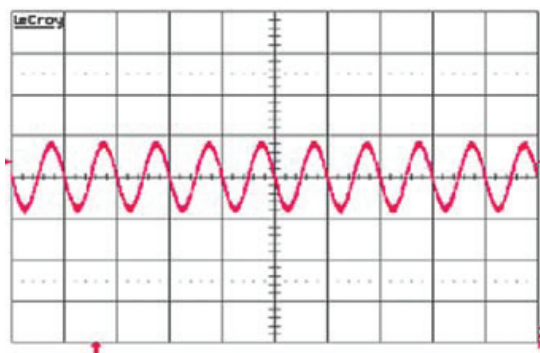
Figure 4.9.1.1 Receiver Circuit



### Checking Flow



### Waveform



**Figure 5.9.1.5 sine waveform**

## 4. TROUBLE SHOOTING

### 4.9.2 Speaker Trouble

#### Check speaker signal path

- RCV\_SPK\_OUT\_P/N (TP1, TP2)
- SPK\_P/N (TP3, TP4)
- Analog SW (U500)
- RCP\_SPK\_P/N (TP5, TP6)

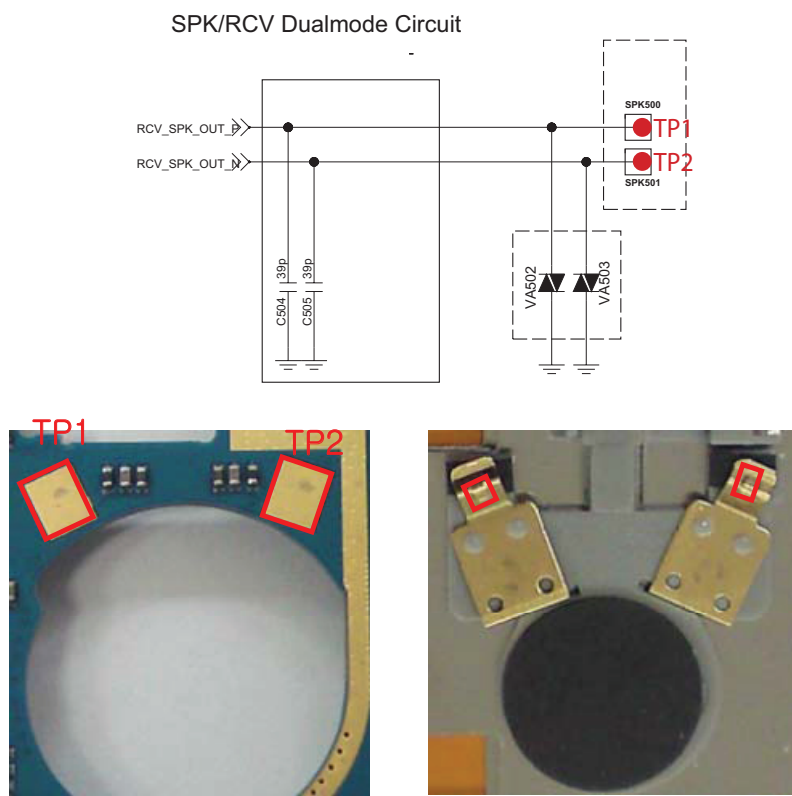


Figure 4.9.2.1 Speaker pad contact check

## 4. TROUBLE SHOOTING

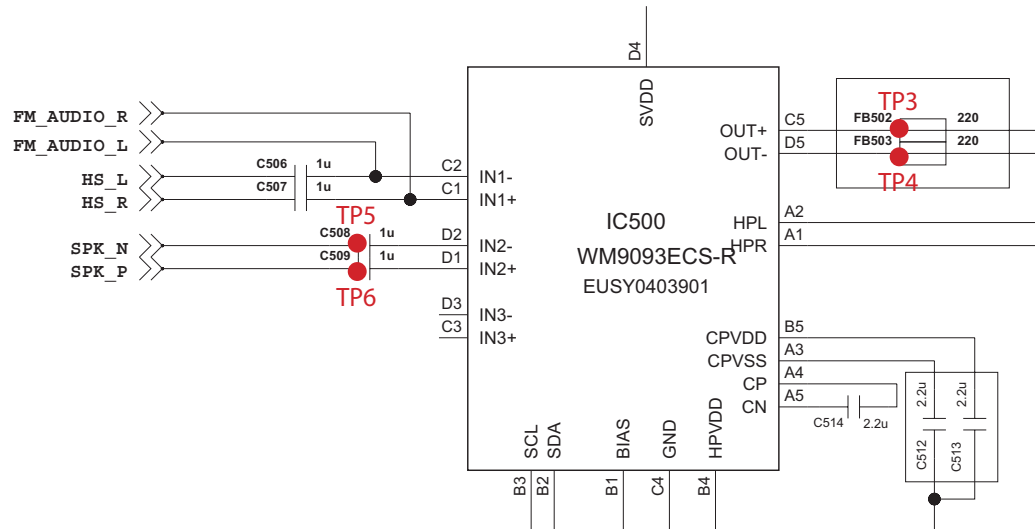
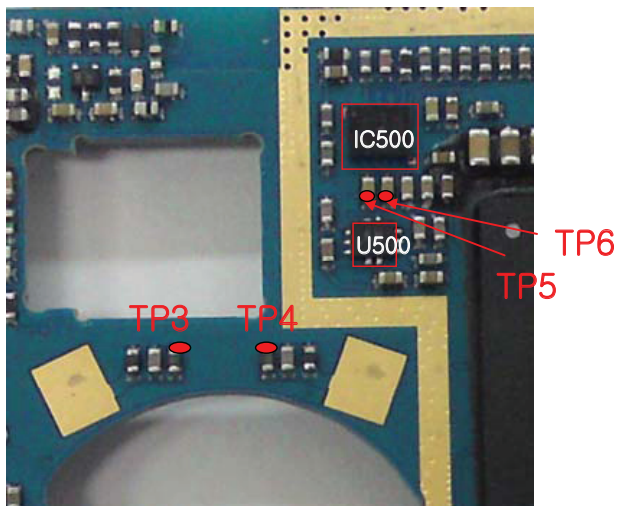


Figure 4.9.2.1 Speaker circuit check



Sine Waveform

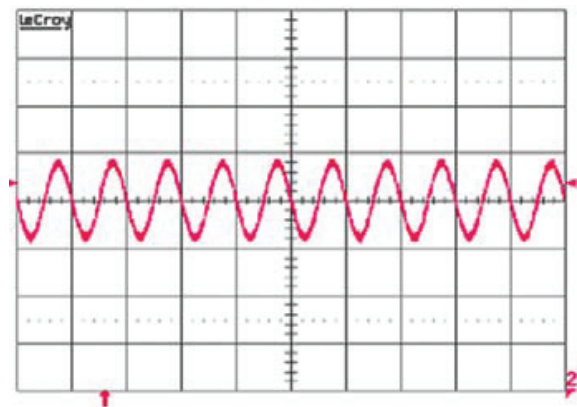
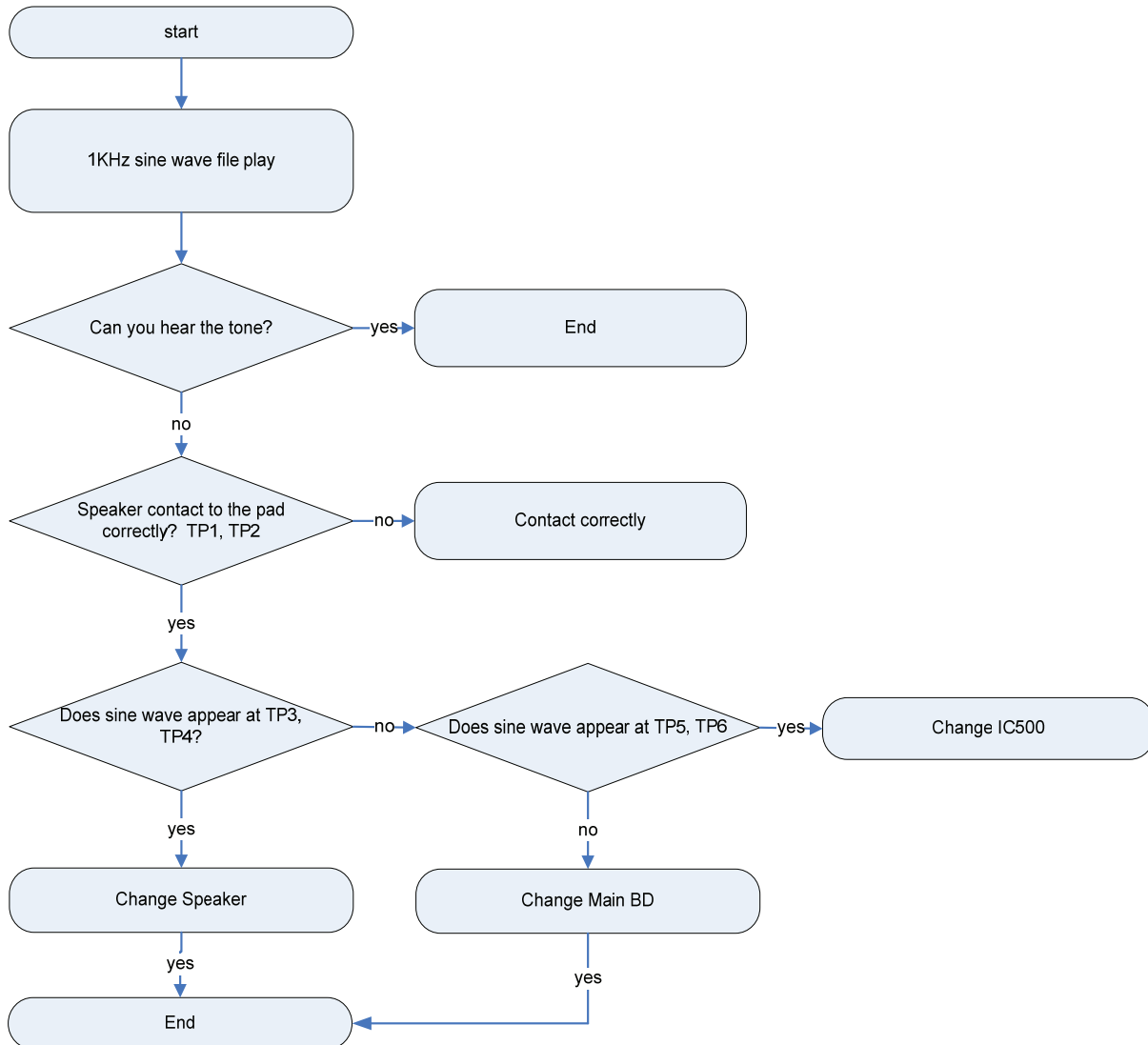


Figure 4.9.2.2 speaker check point

## 4. TROUBLE SHOOTING

Flow chart



### 4.9.3 MIC Trouble

#### Check MIC signal path

- FPCB VMIC\_BIAS\_P (TP1)
- FPCB MIC\_P (TP2)
- MIC100

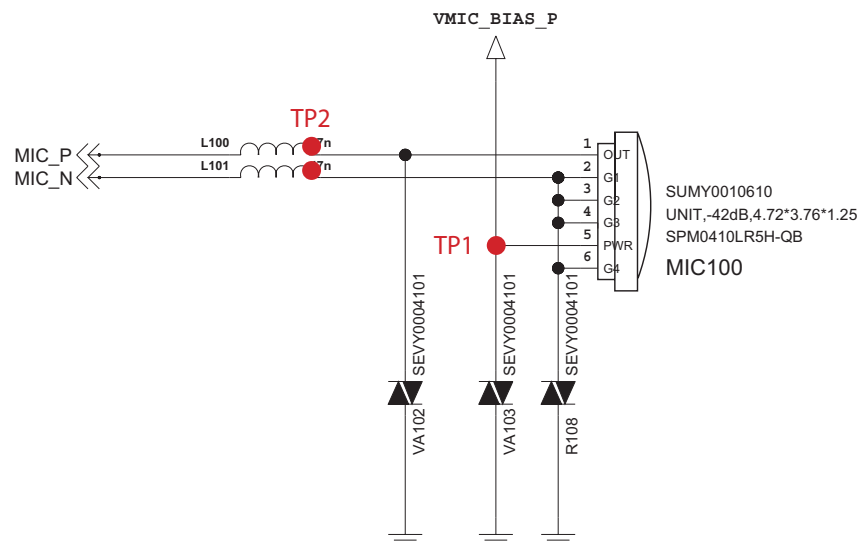


Figure 4.9.3.1 FPCB MIC Check point

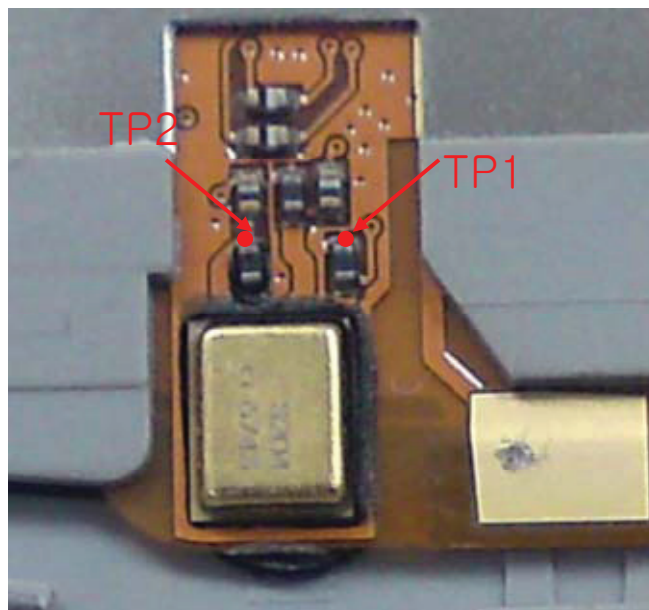
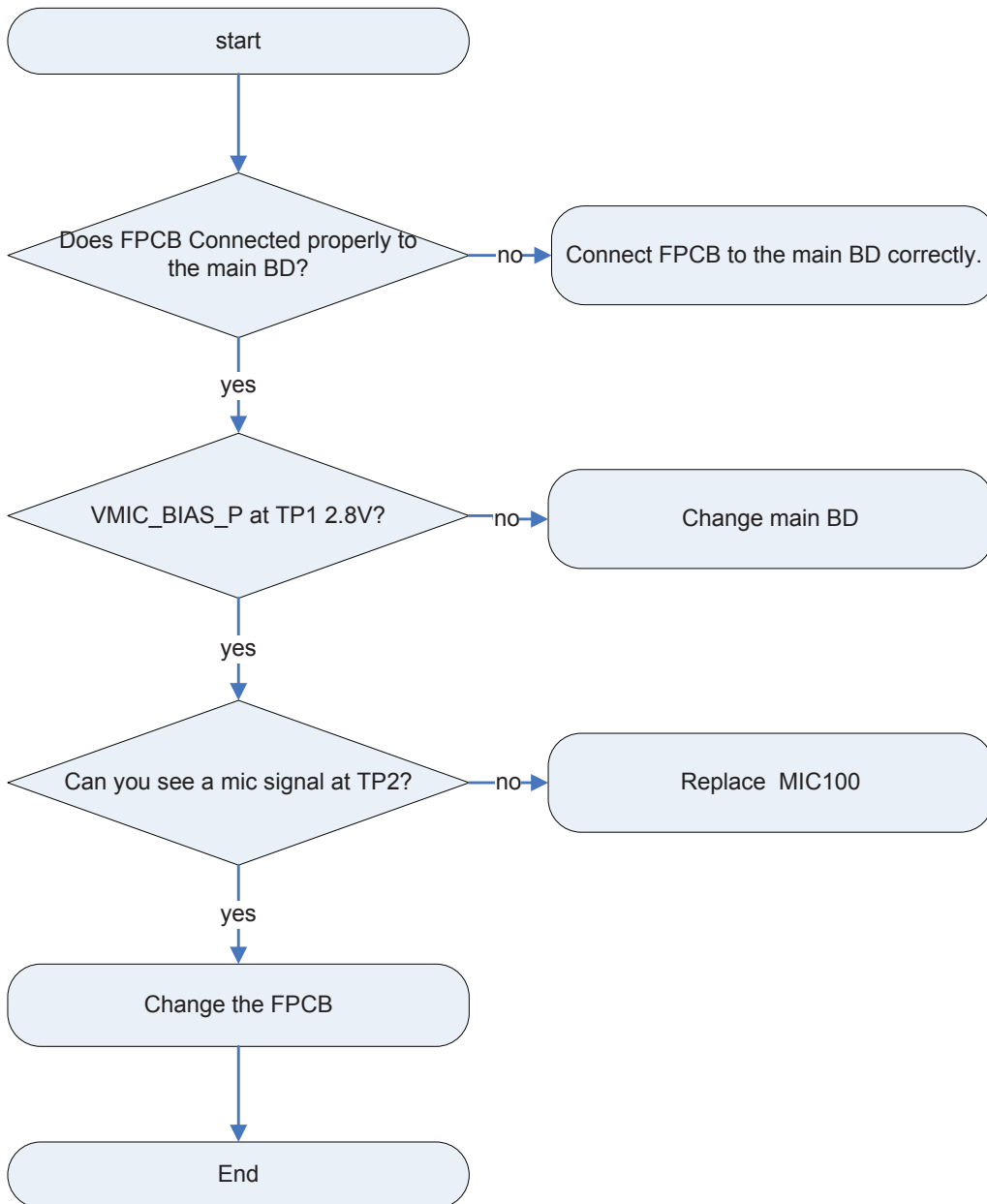


Figure 4.9.3.2 FPCB MIC Check point

## 4. TROUBLE SHOOTING

---

Flow Chart



### 4.9.4 Headset sound play Trouble

#### Check Headset sound signal path

-MUSIC (U400), WM9093(IC500)

-HS\_OUT\_ L/R (TP1, TP2)

-HS\_ L/R (TP3, TP4)

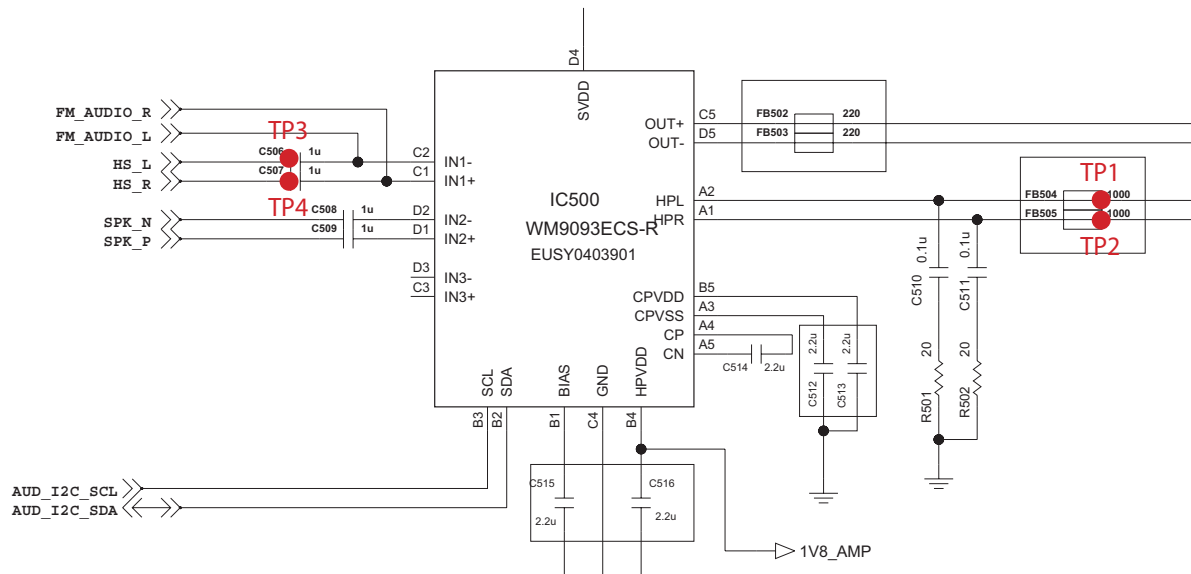
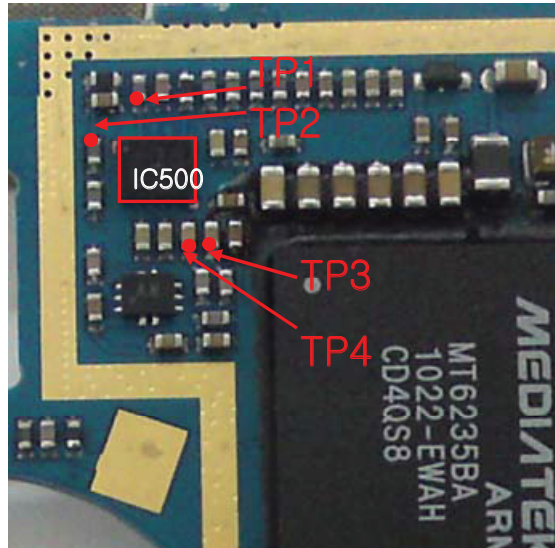
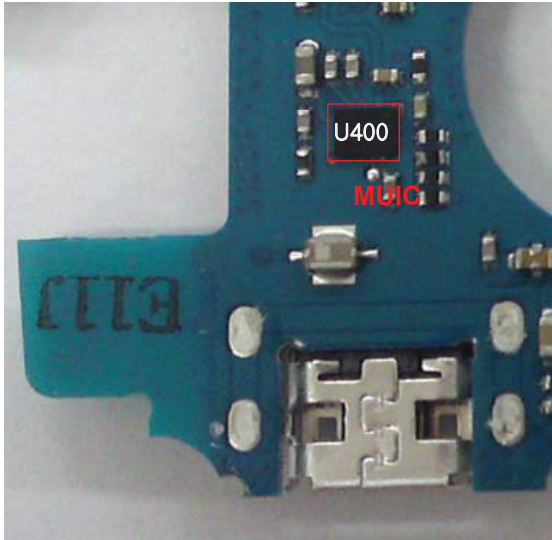


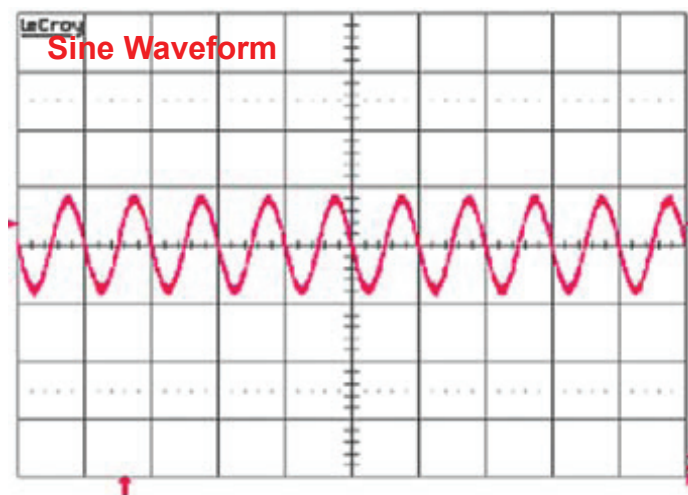
Figure 4.9.4.1 Headset Circuit for sound Check

## 4. TROUBLE SHOOTING

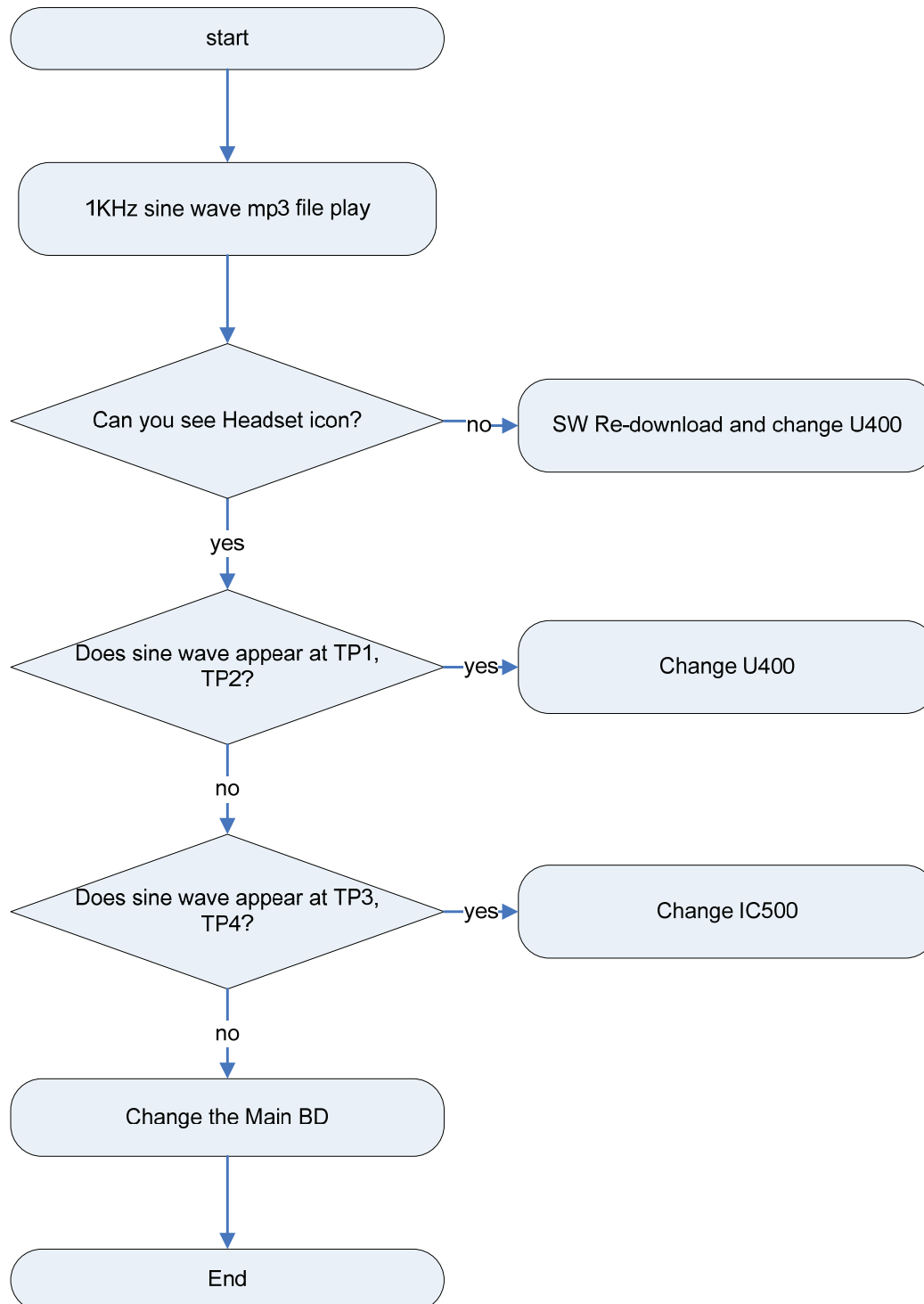
### Checking Points



### Waveform



Flow chart



## 4. TROUBLE SHOOTING

### 4.9.5 Headset Receiving voice Trouble

#### Check Headset voice signal path

- MUIC (U400), WM9093(IC500)
- HS\_OUT\_L/R (TP1, TP2)
- SPK\_P/N (TP3, TP4)
- RCV\_SPK\_P/N (TP5, TP6)

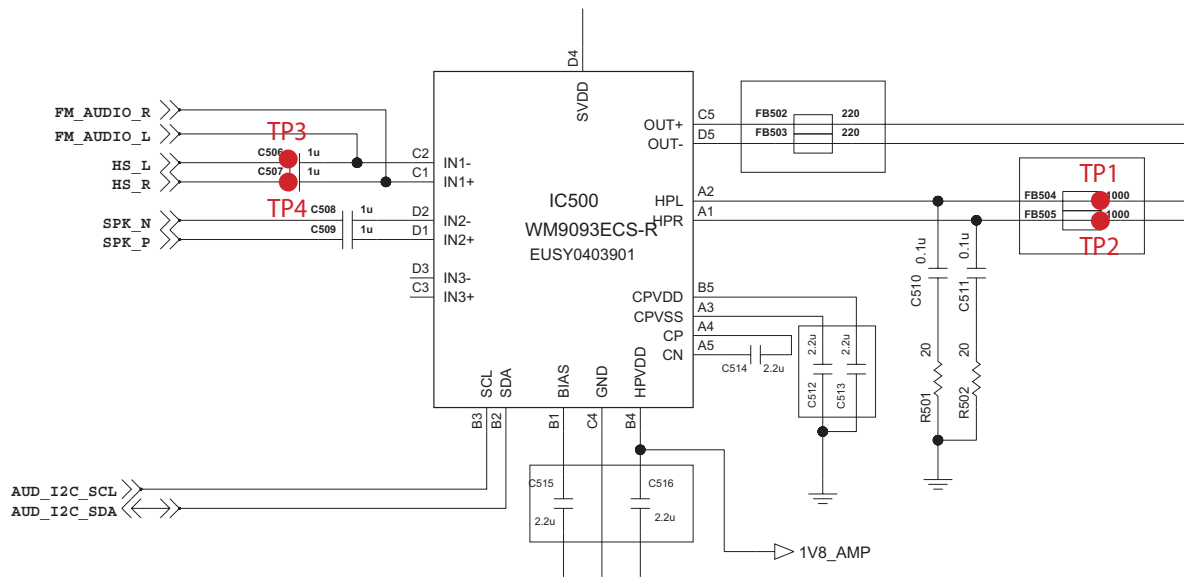
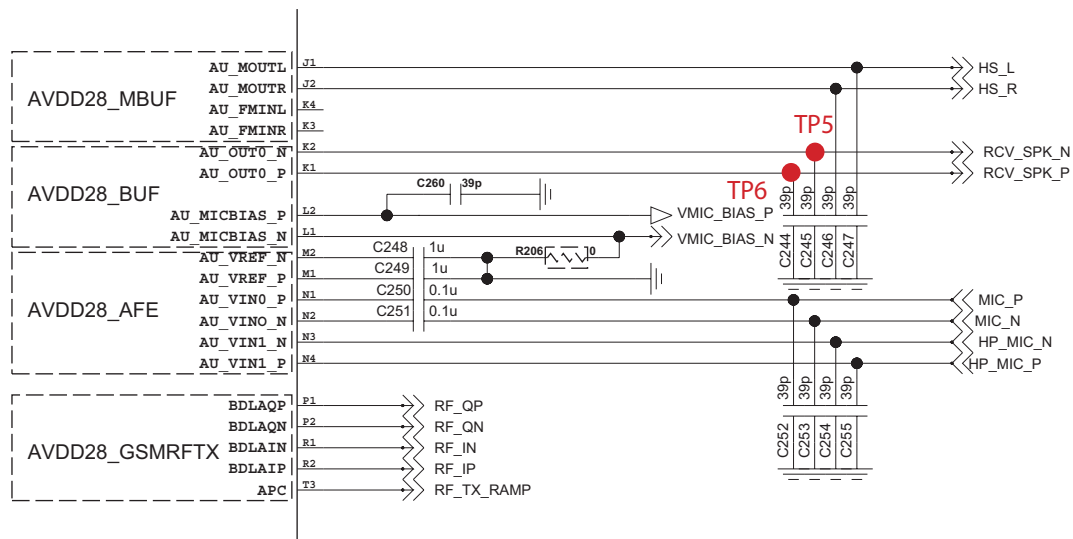


Figure 4.9.5.1 WM9093 check point



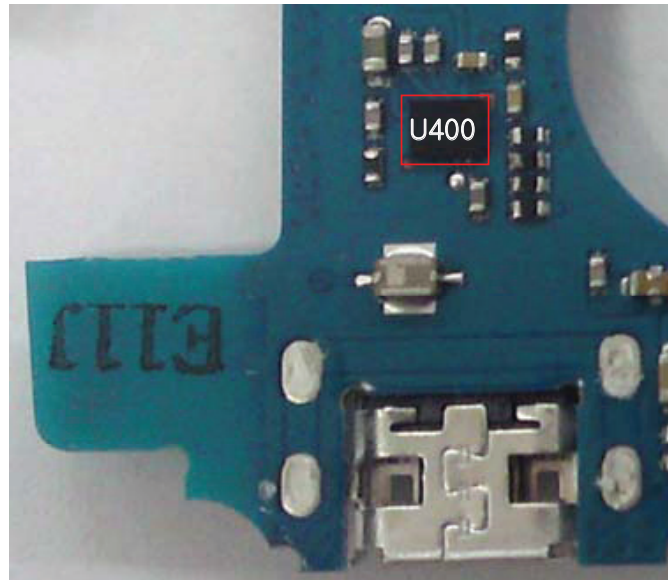


Figure 4.9.5.3 MUIC check point

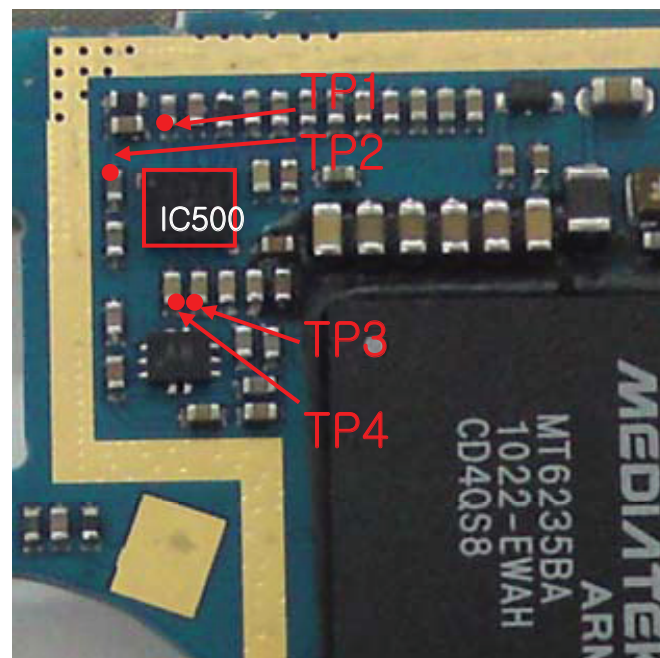
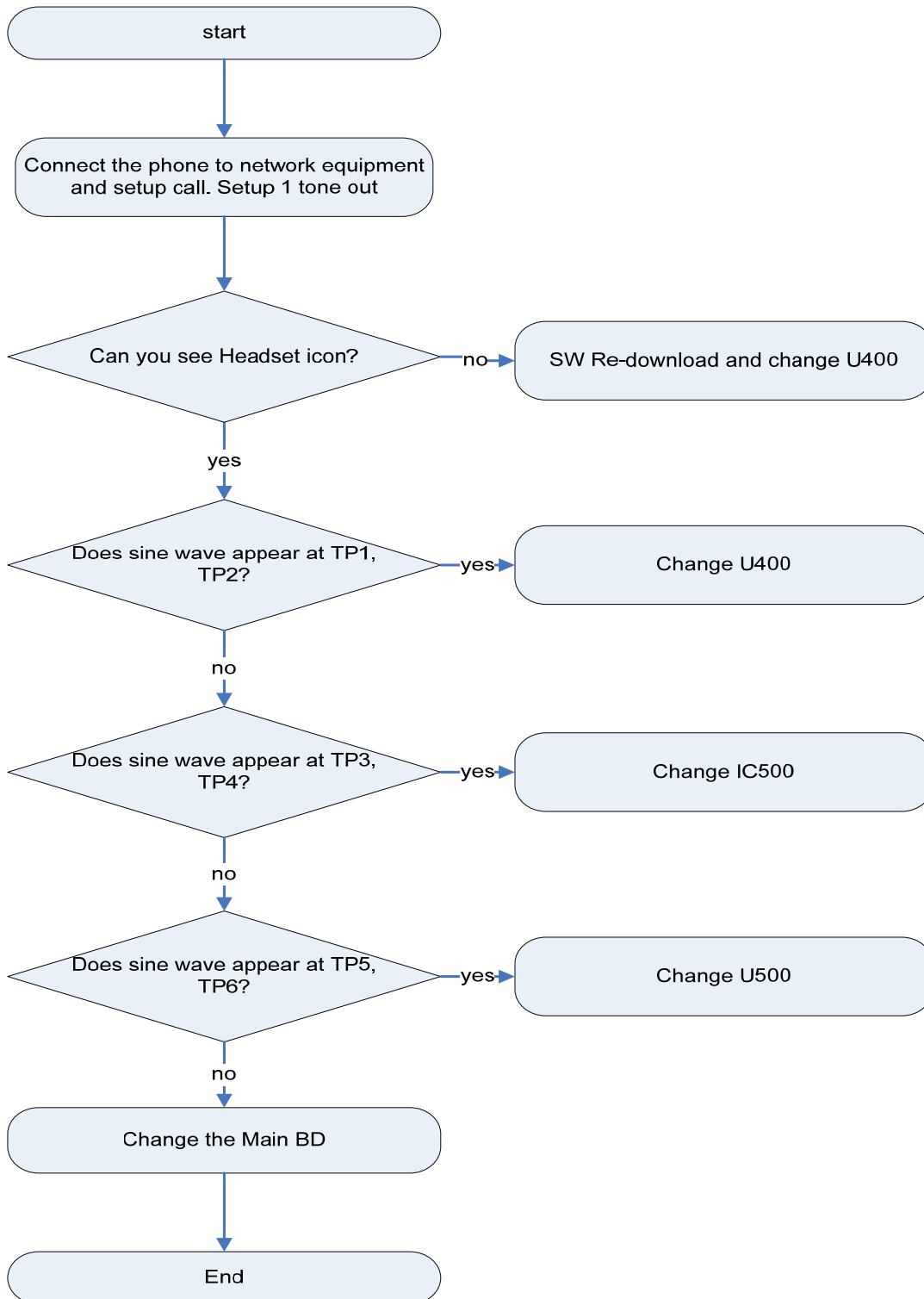


Figure 4.9.5.4 WM9093 check point

## 4. TROUBLE SHOOTING

Flow chart



### 4.9.6 Headset MIC Trouble

#### Check Headset voice signal path

- MUIC (U400),
- HS\_MIC\_P (TP1)
- HP\_MIC\_P (TP2)

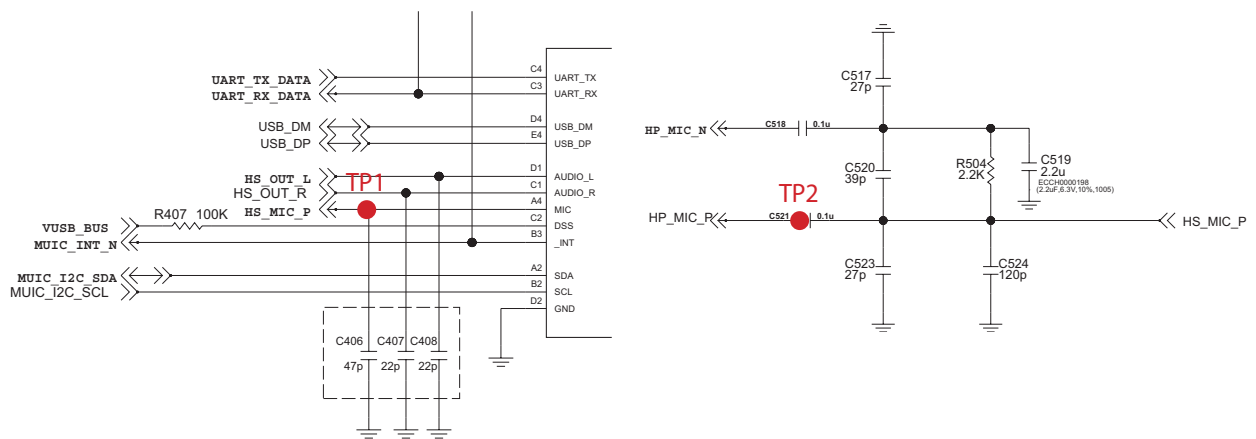


Figure 4.9.6.1 WM9093 check point

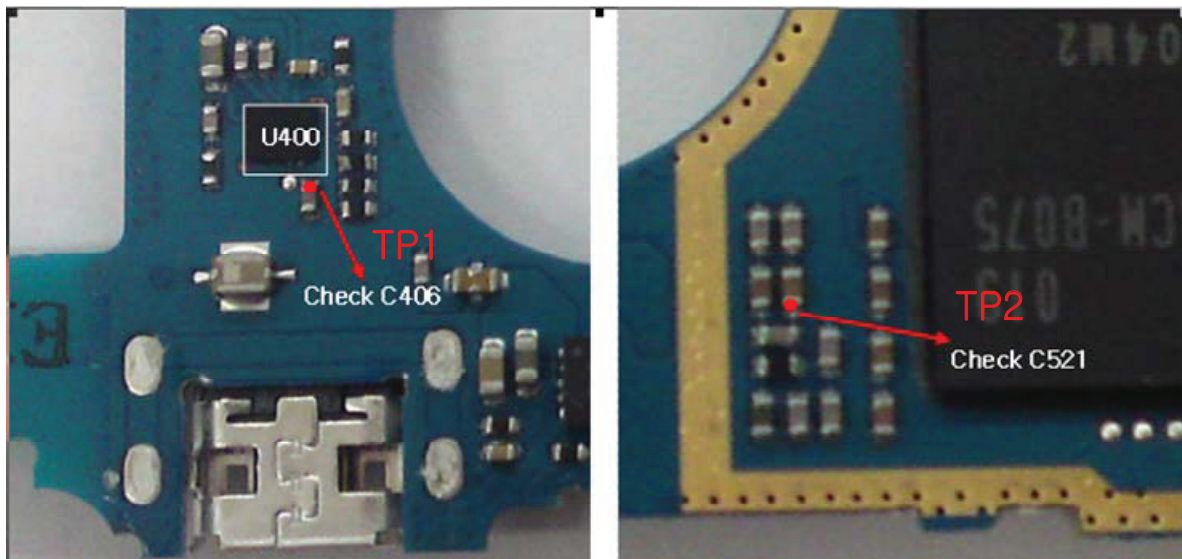
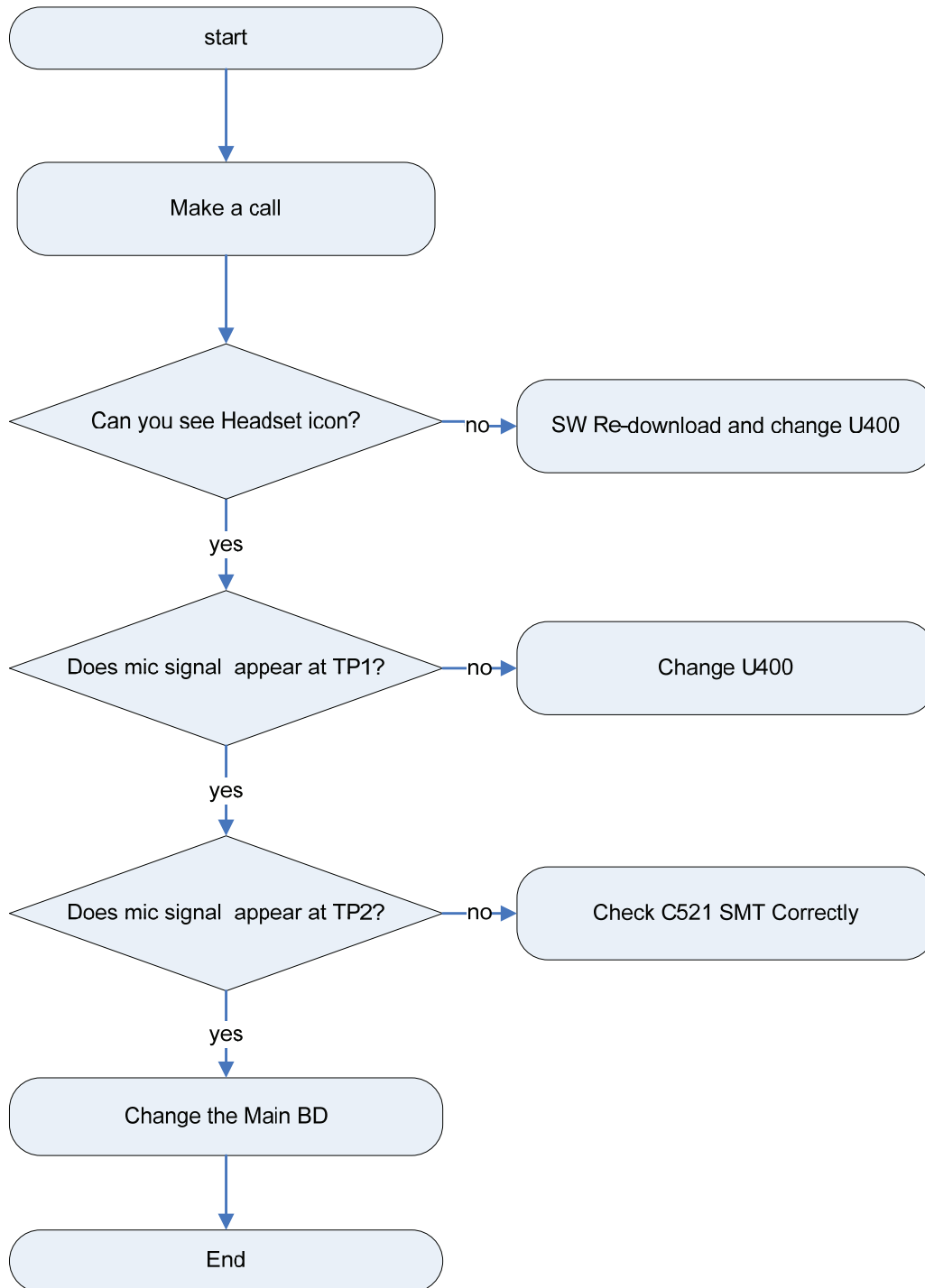


Figure 5.9.6.2 Headset MIC check point

## 4. TROUBLE SHOOTING

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Flow chart



### 4.10 Camera Trouble

#### Check the camera power and signal

- VCAM\_1V8 (TP2), VCAM\_2V8 (TP1)
- CAM\_MCLK (TP3), CAM\_PCLK (TP4)

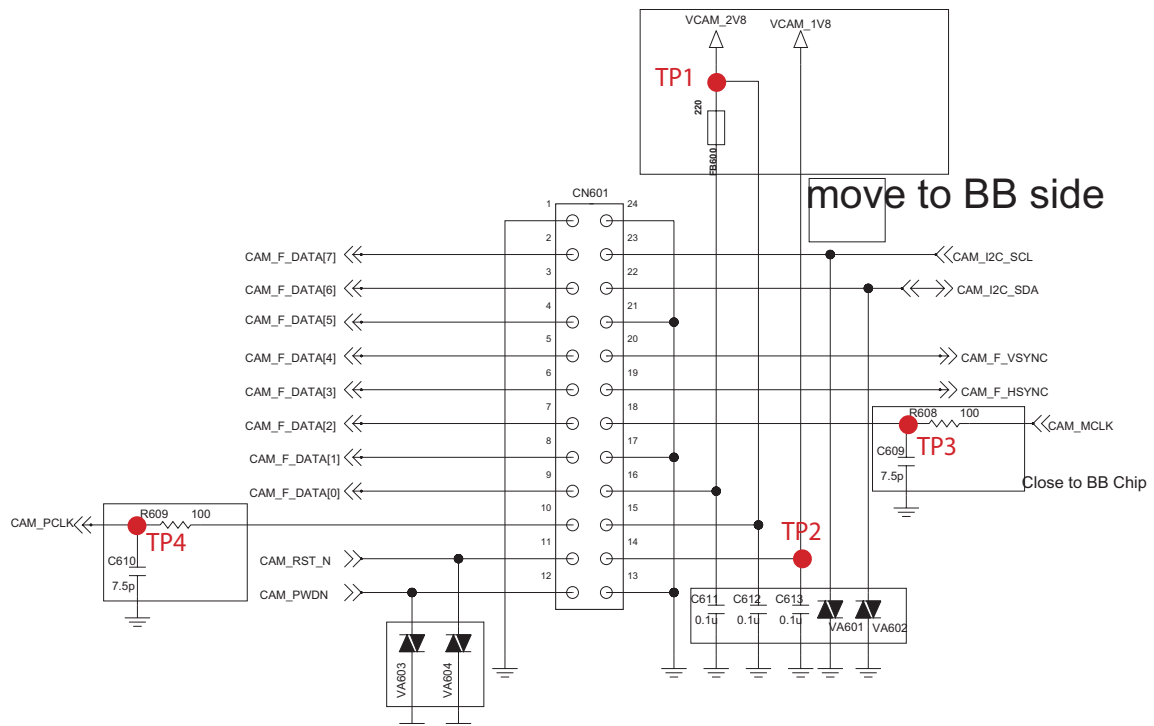
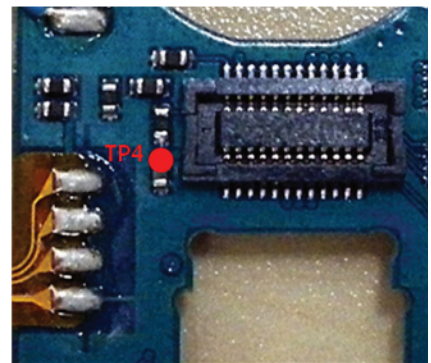
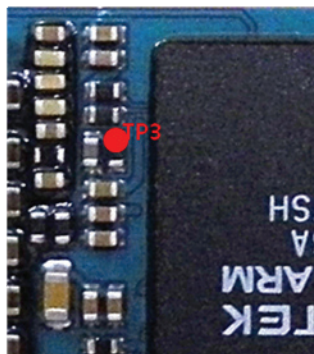
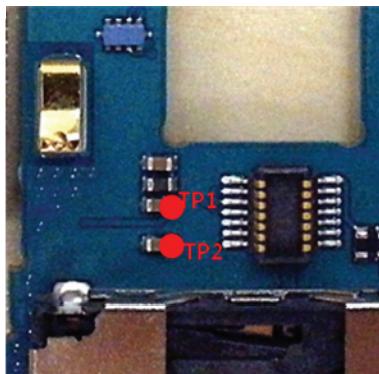


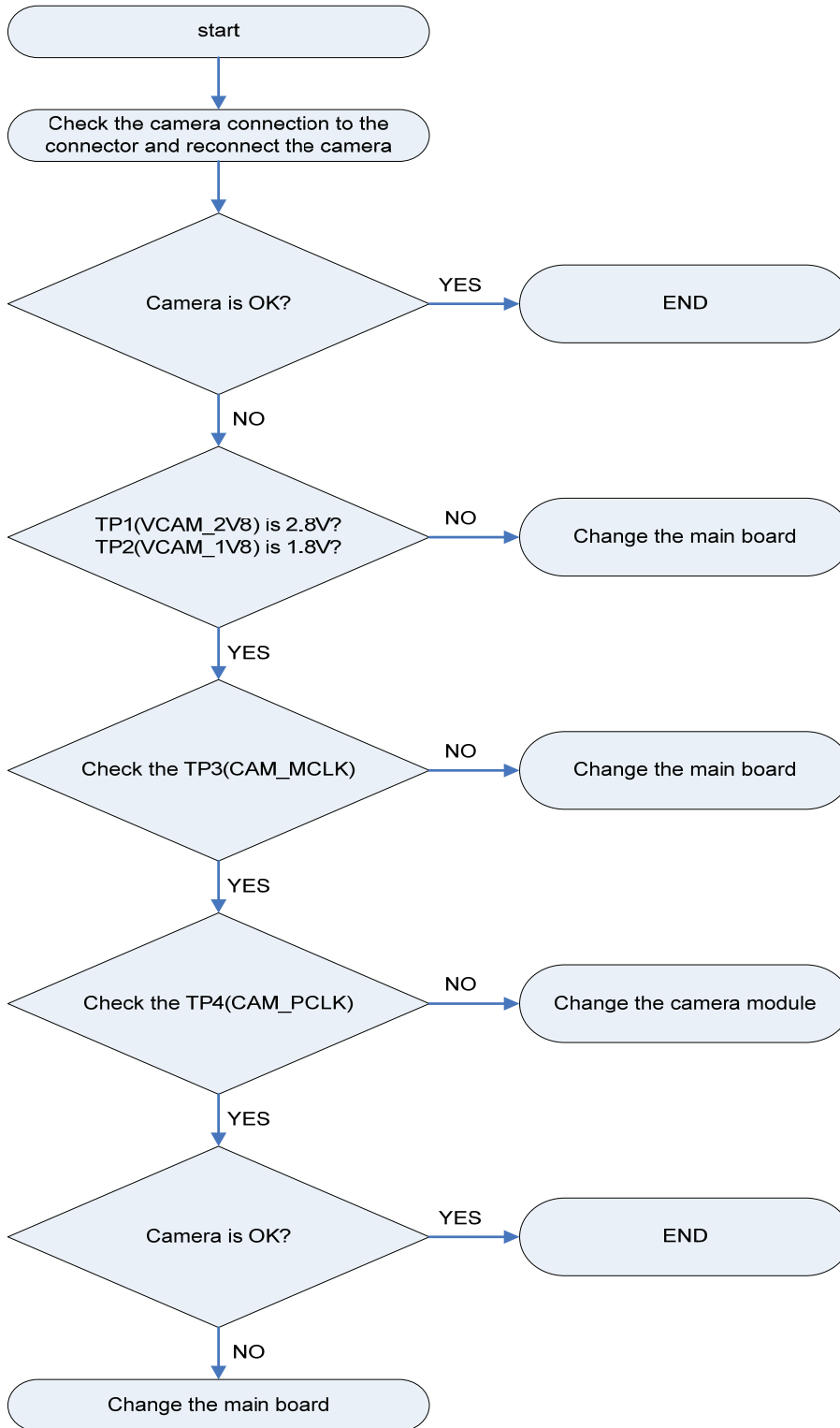
Figure 4.10.1 Camera Circuit

#### Checking Point



## 4. TROUBLE SHOOTING

### Checking Flow



### Waveform

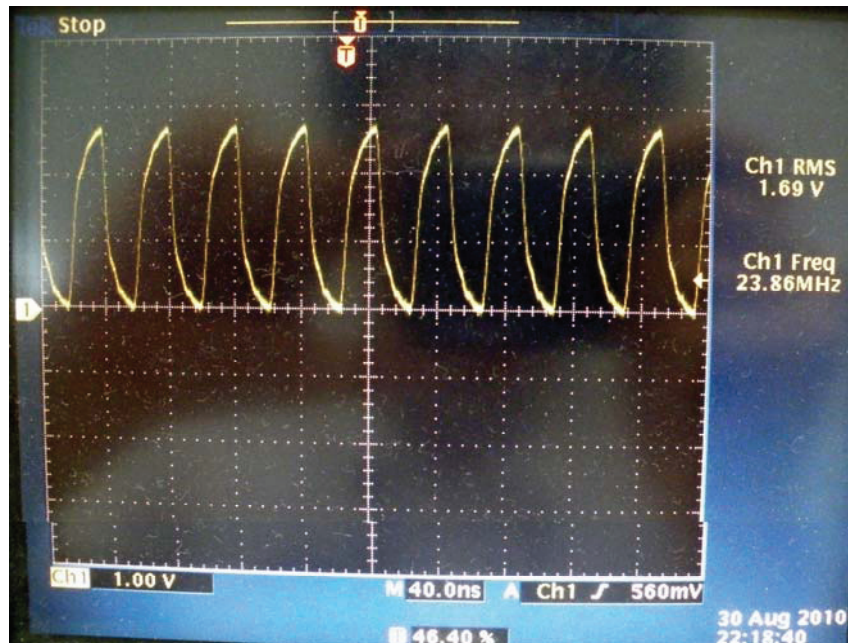


Figure 4.10.2 Camera 24MHz MCLK Waveform

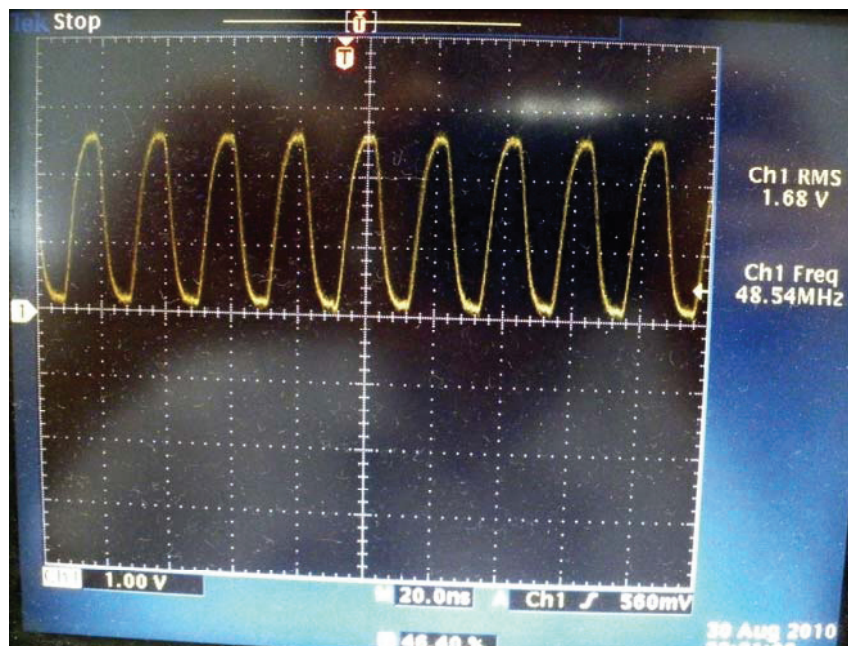


Figure 4.10.3 Camera 48MHz PCLK Waveform

## 4. TROUBLE SHOOTING

### 4.11 Main LCD Trouble

Check the Main LCD power and signal

-VMEM\_1V8 (TP2), VIO\_2V8 (TP1)

-LCD\_CS\_N (TP3), LCD\_RS (TP4), LCD\_RD\_N (TP5), LCD\_WR\_N (TP6), LCD\_D\_[0] (TP7)

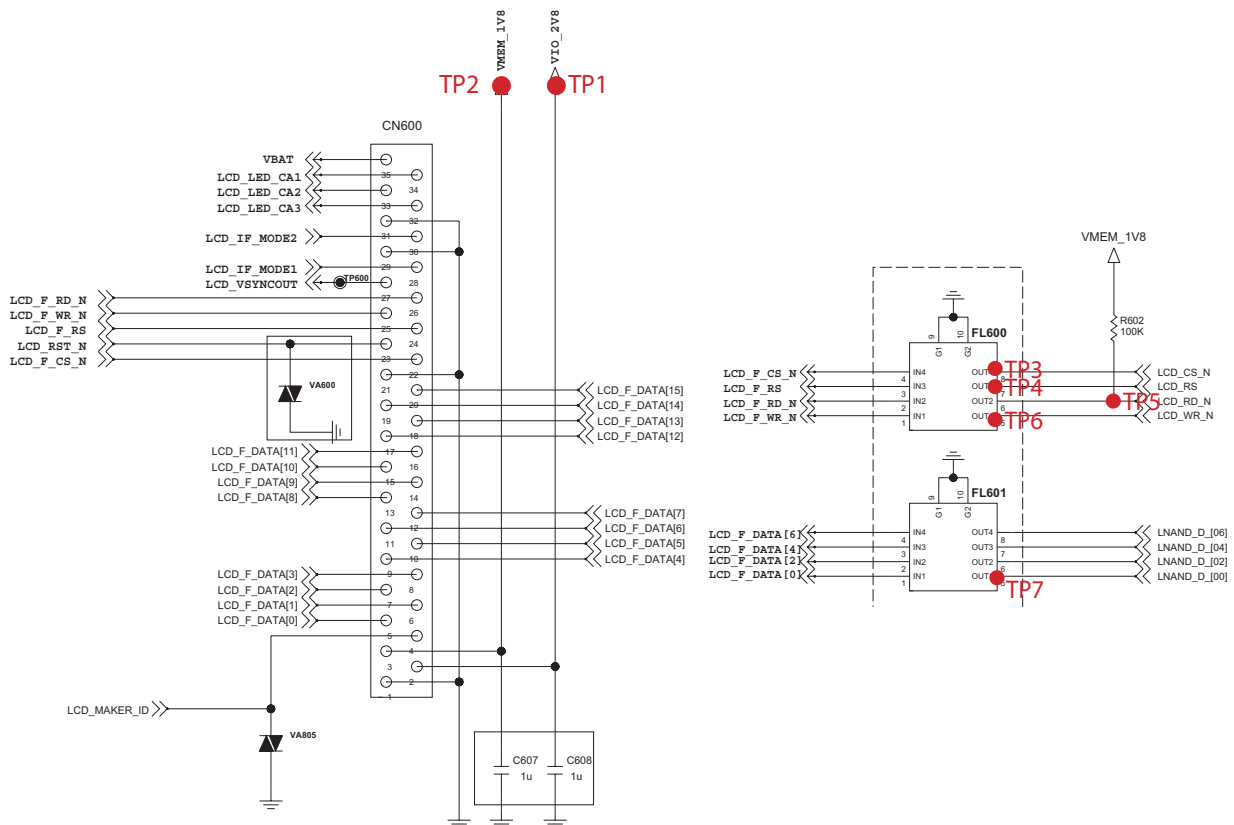
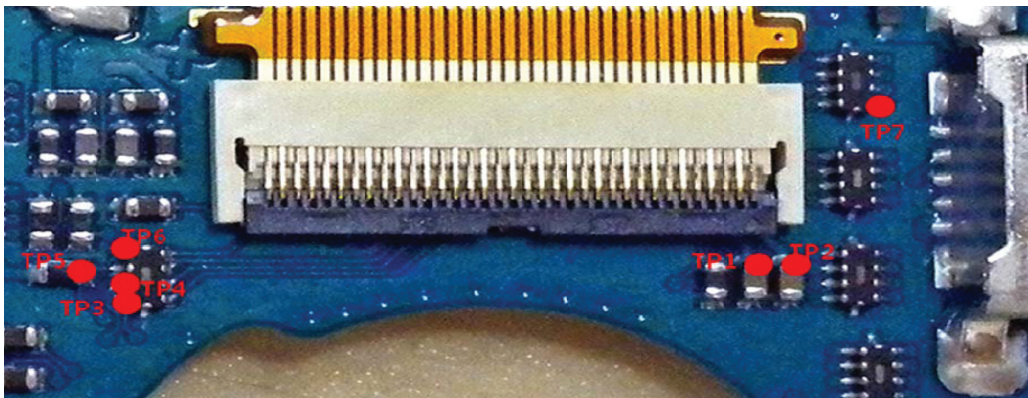
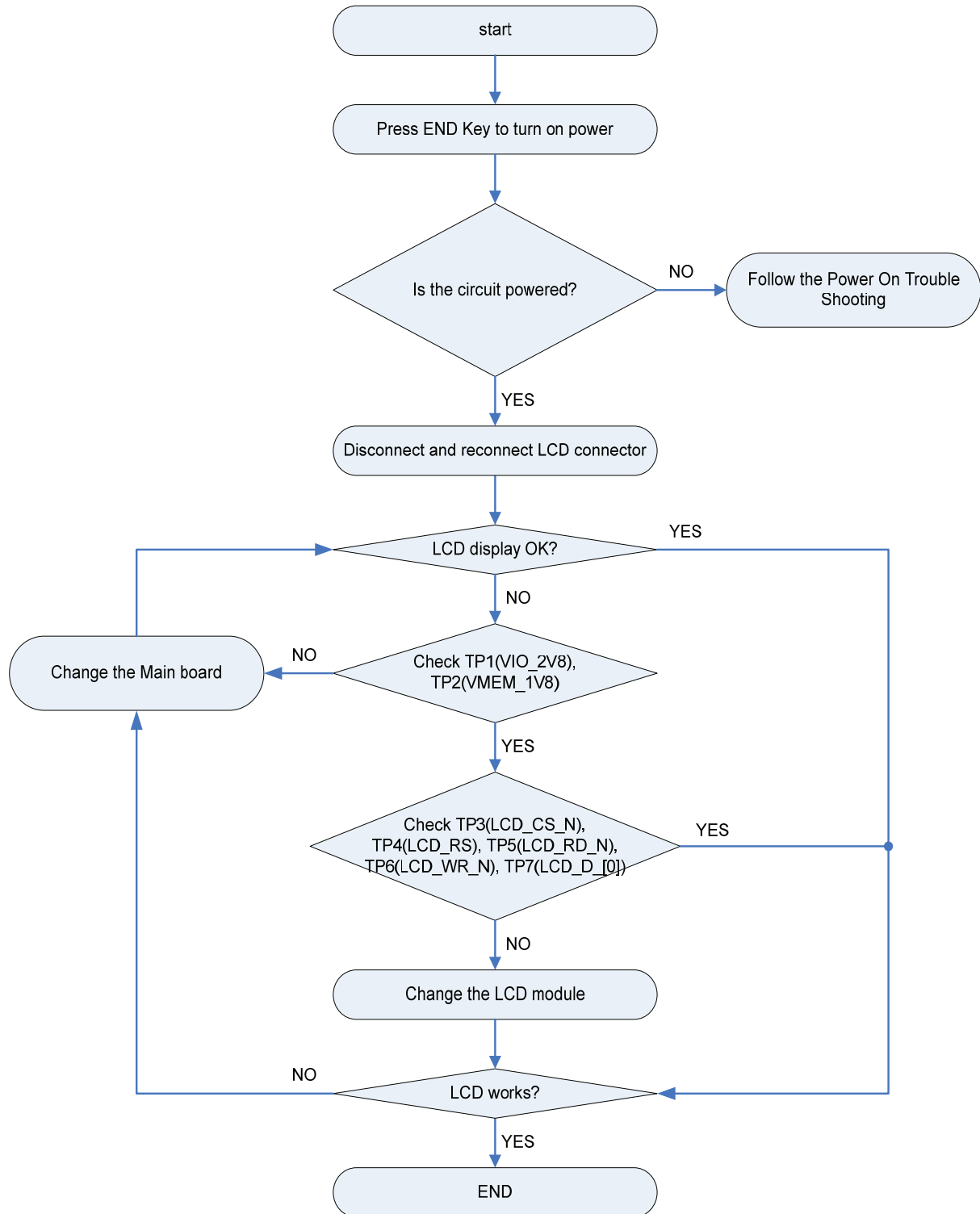


Figure 4.11.1 Main LCD Circuit

#### Checking Point

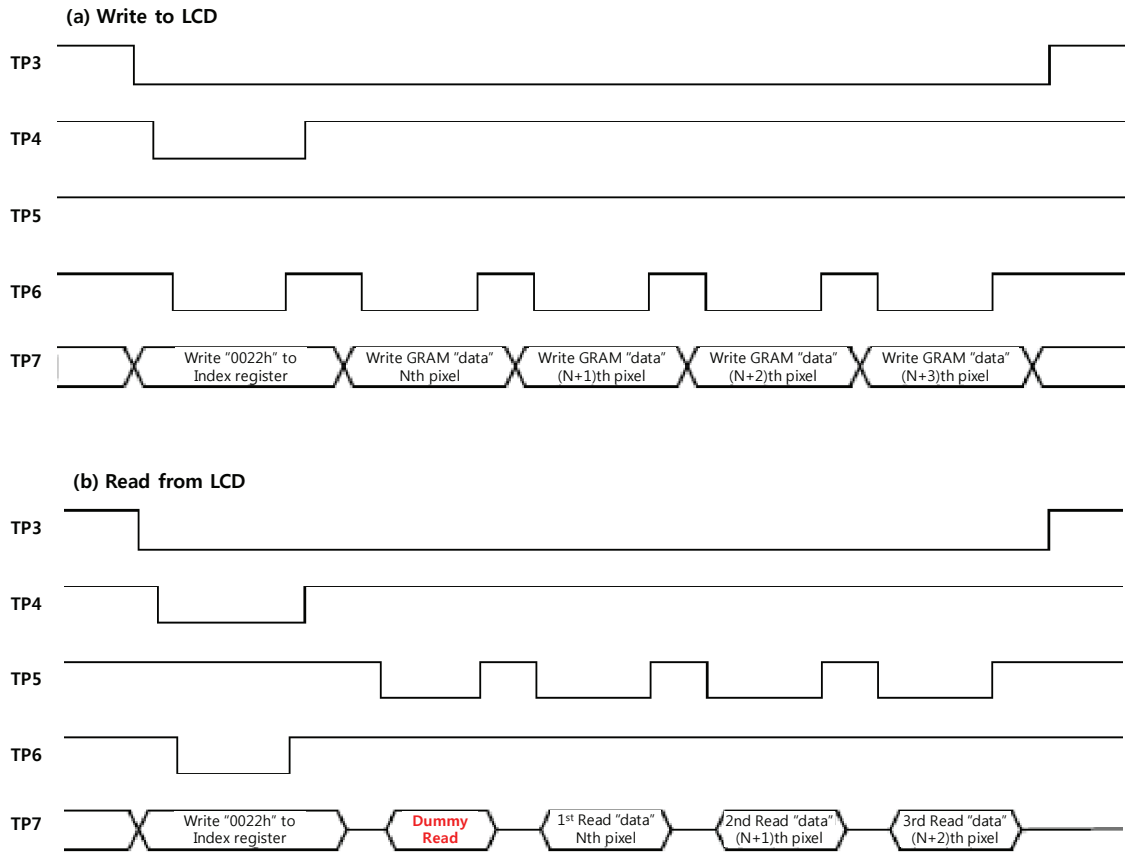


### Checking Flow



# 4. TROUBLE SHOOTING

## Waveform



### 4.12 Vibrator Trouble

Vibrator is operate when DC motor driver is enabled

#### Check Point

- difference of TP1 (Mot+) & TP2 (Mot-)

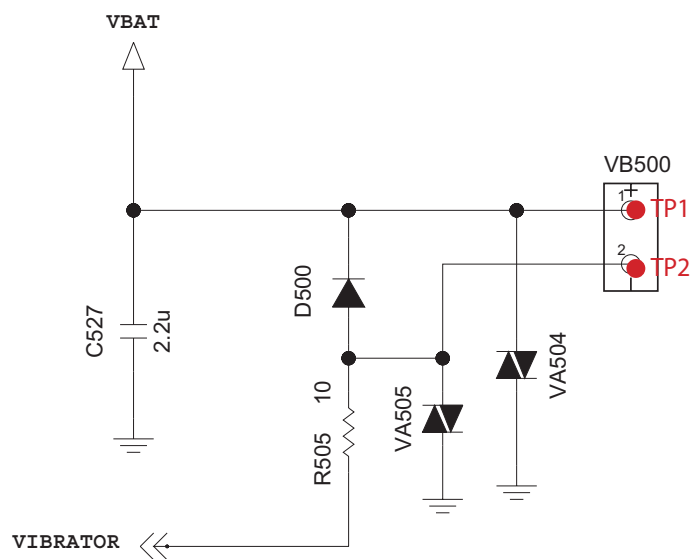
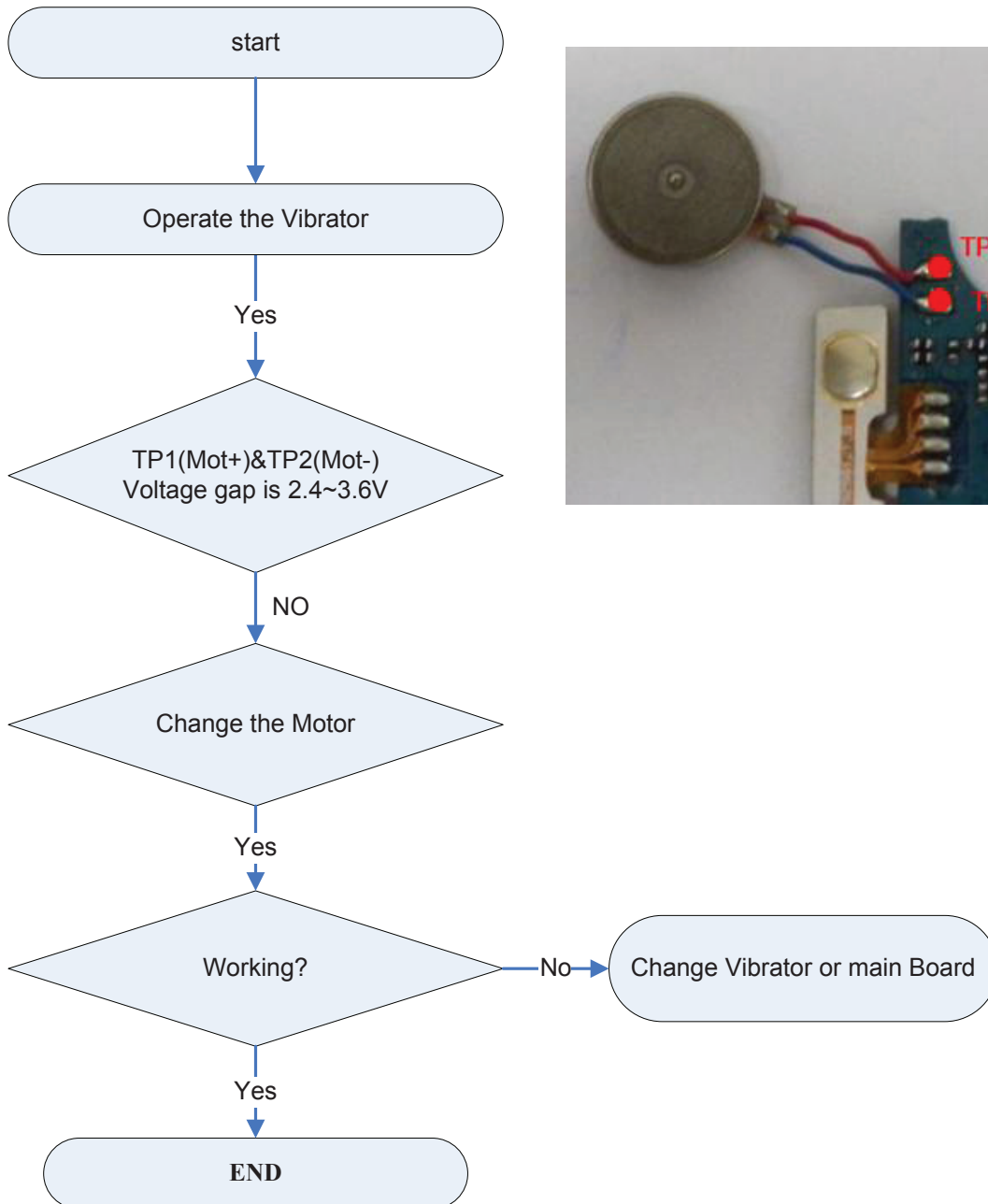


Figure 4.12.1 Vibrator Trouble Circuit

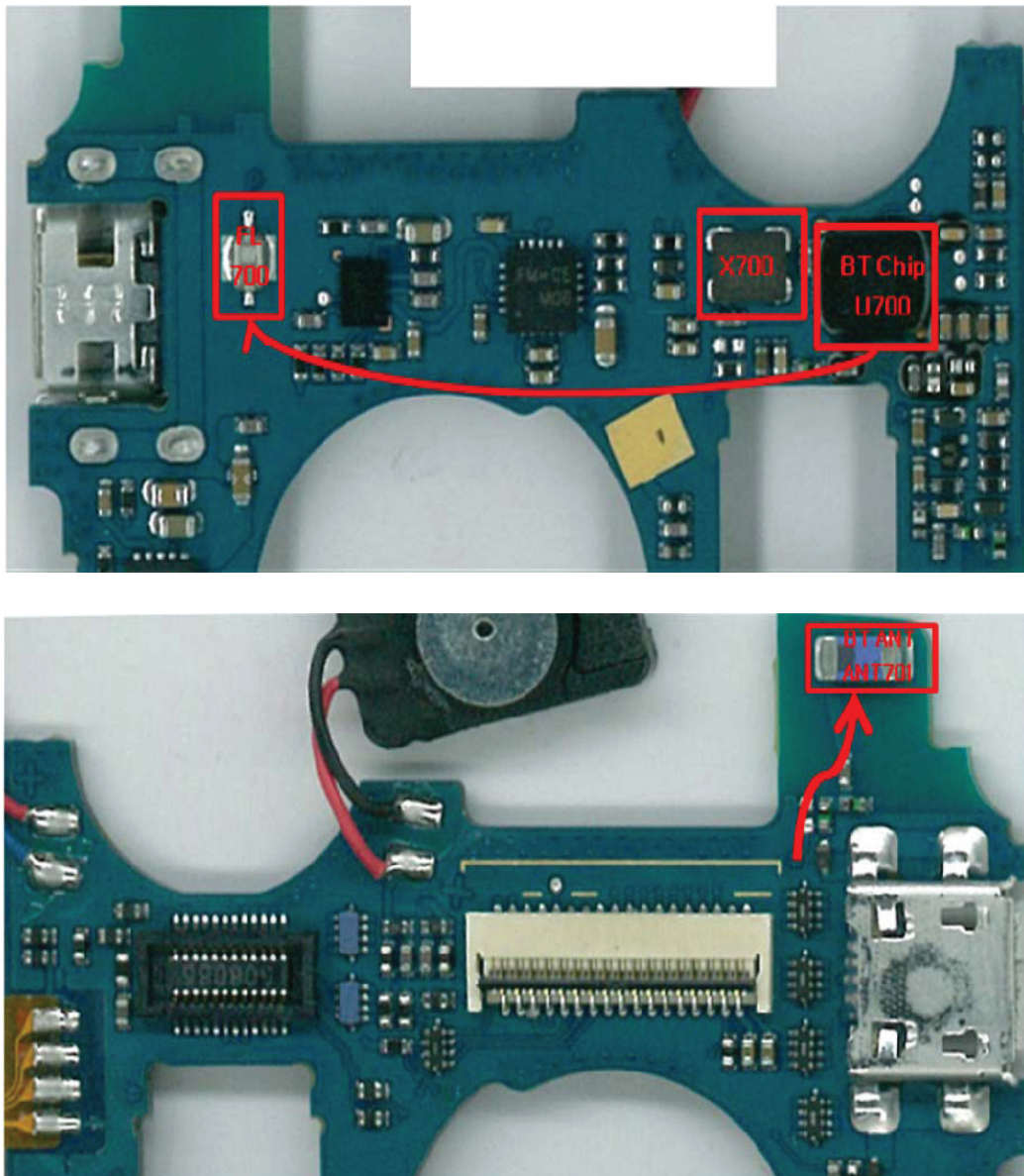
## 4. TROUBLE SHOOTING

### Checking Points and Flow



### 4.13 BT Trouble

#### 4.13.1 BT Component & Signal Path



**TABLE 4.13.1**

Reference	Description
U700	BT/FM MAIN CHIP
X700	BT XO(26MHZ)
FL700	BT FILTER
ANT701	BT ANTENNA

## 4. TROUBLE SHOOTING

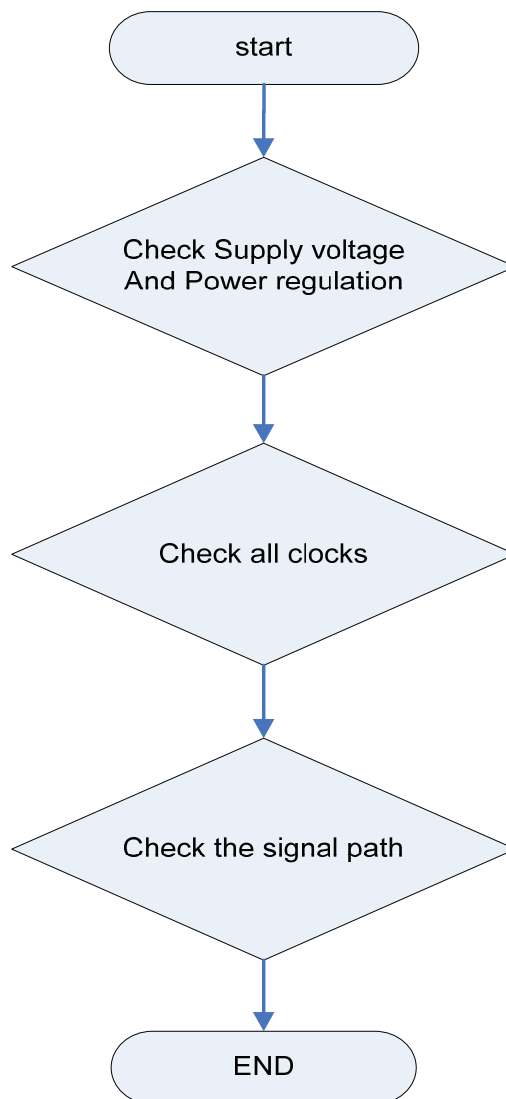
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### 4.13.2 TROUBLE SHOOTING

Please follow the below process

1. Check the BT Power Regulation and Supply voltage
2. Check the Clock
3. Check the signal path

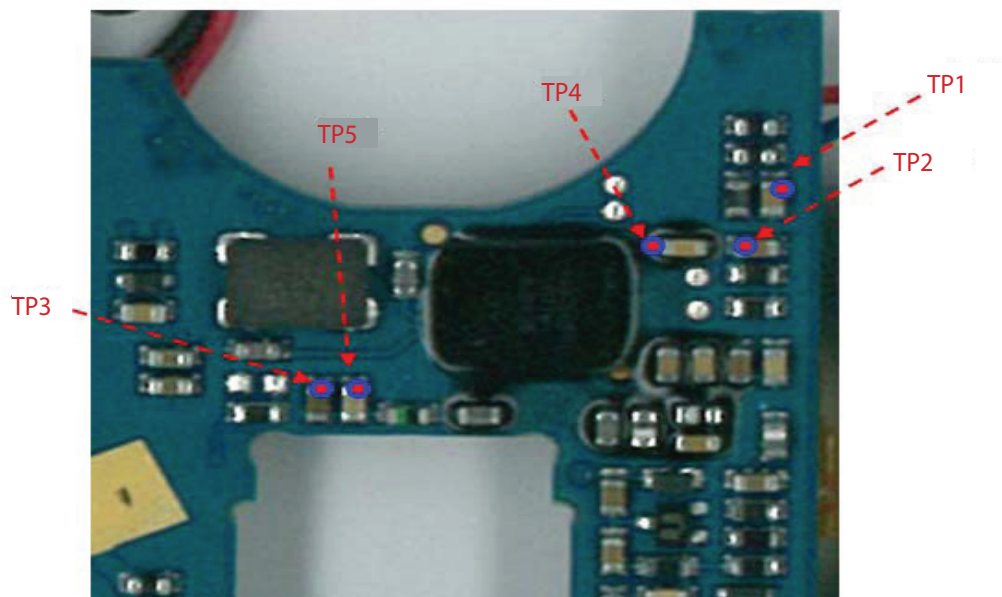
**Checking Flow**



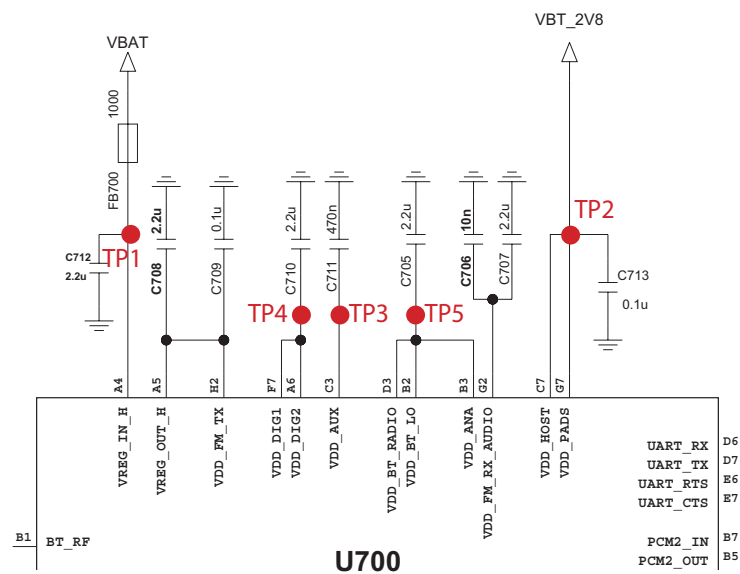
### 4.13.2.1 Check the BT Power Regulation and Supply Voltage

- BT Chip has two supply voltage and Power regulator
- VBAT Voltage, VBT\_2V8
- VDD\_DIG, VDD\_AUX, VDD\_ANA

#### Board Picture



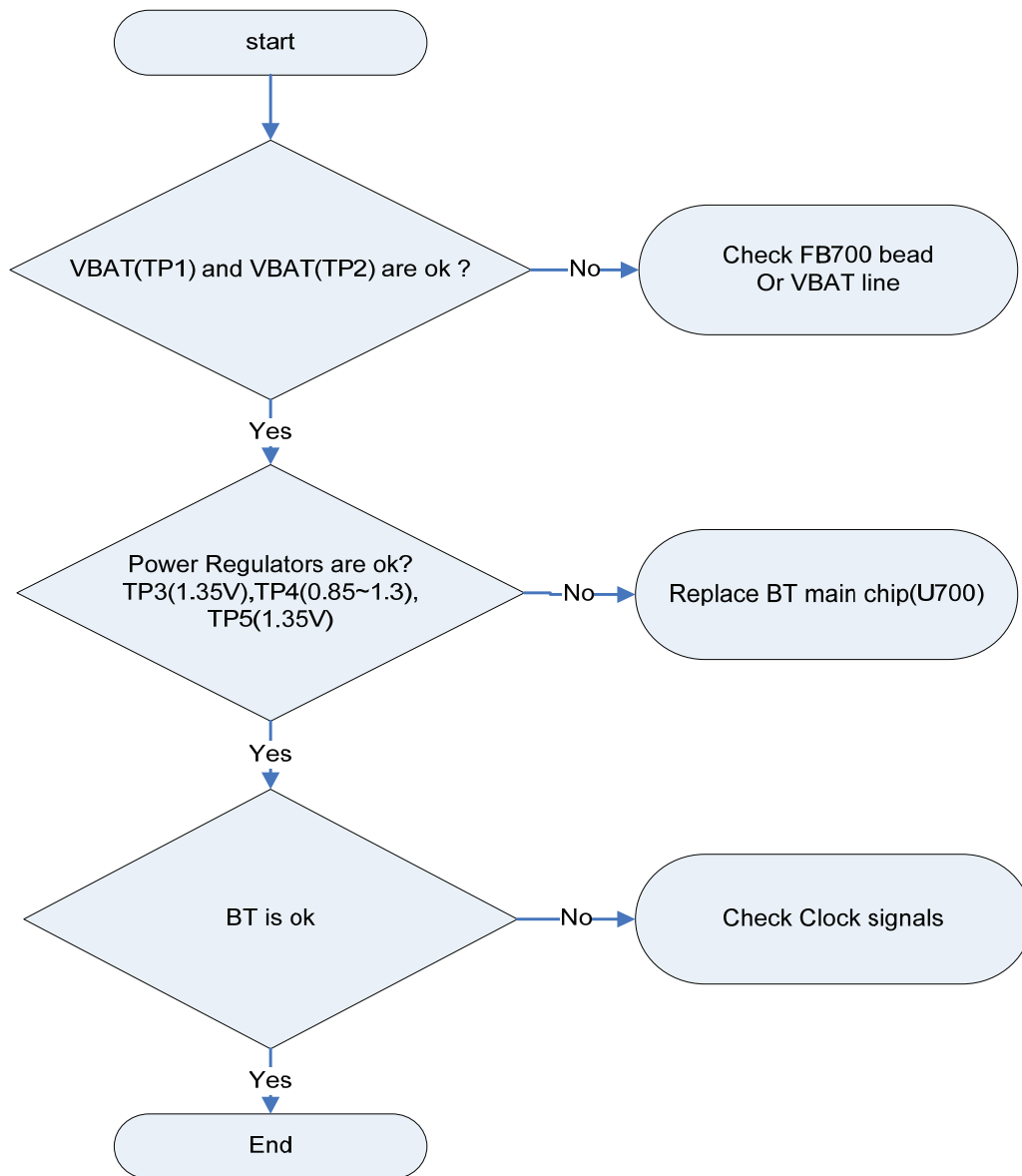
#### Circuit Diagram



## 4. TROUBLE SHOOTING

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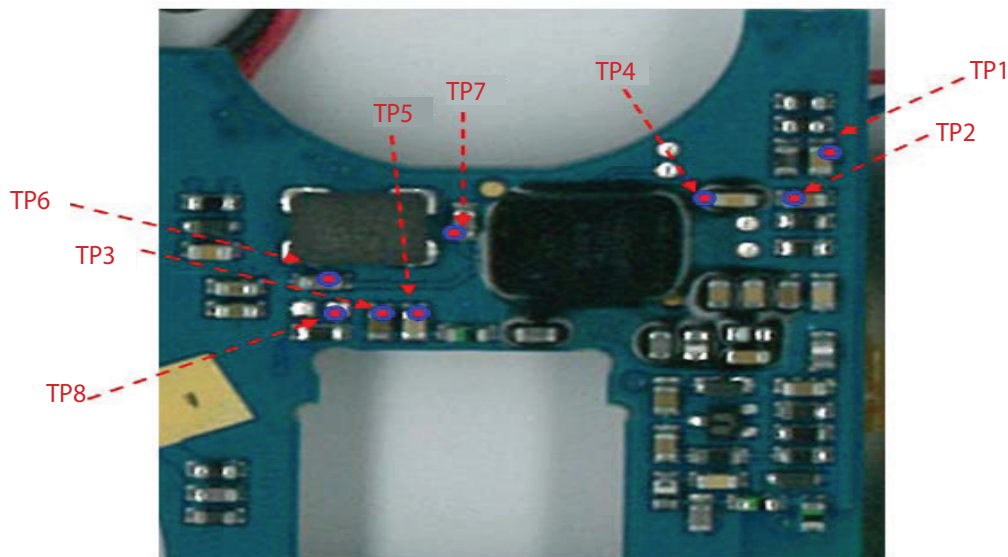
### Check flow



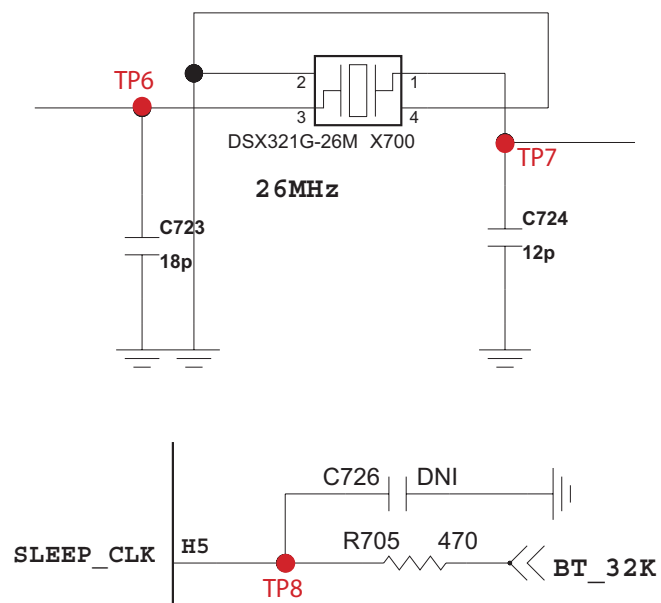
### 4.13.2.2 Check the Clock Signal

- BT Chip consists of two kinds of clock. One is sys clock(26M), the other sleep clock (32khz)

#### Board Picture

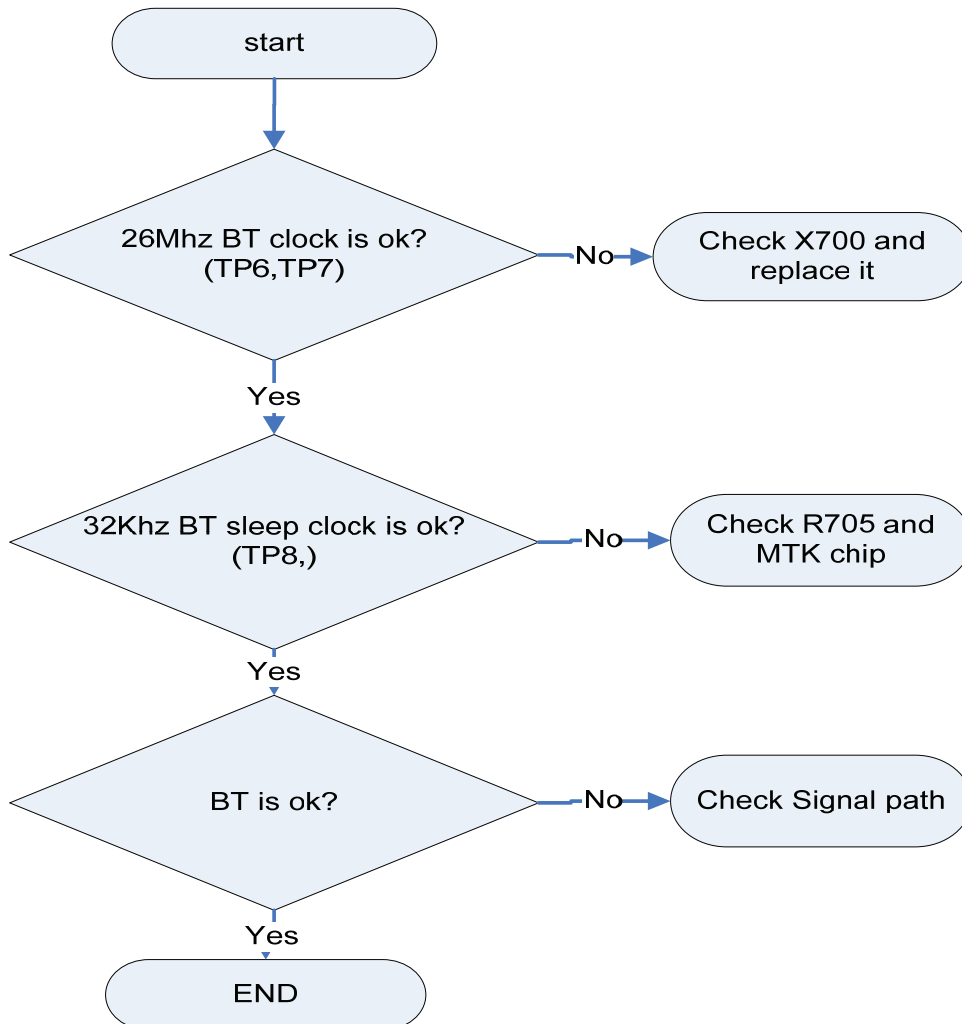


#### Circuit Diagram

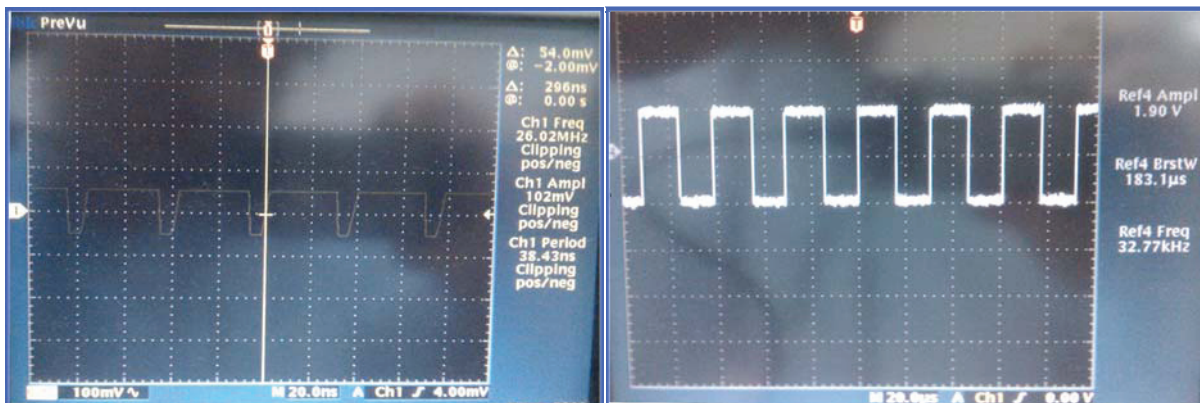


## 4. TROUBLE SHOOTING

### Check flow



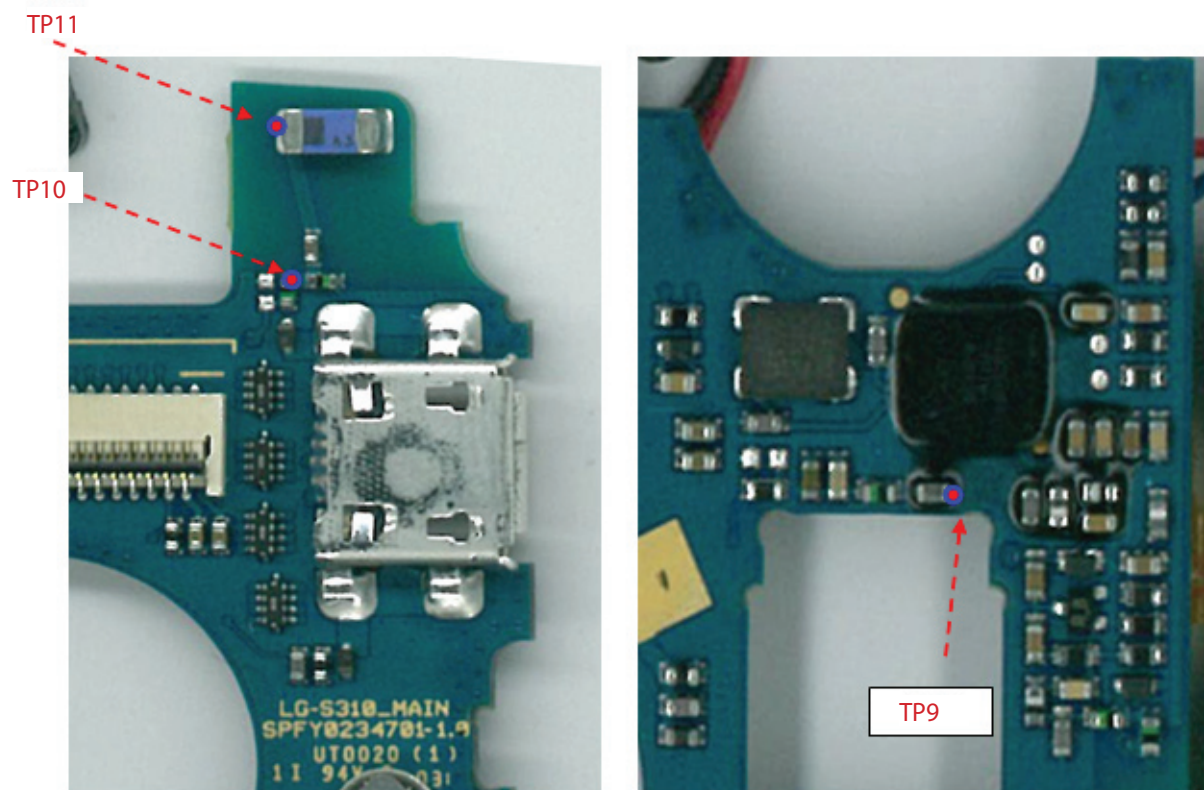
### BT&FM CLOCK-Waveform



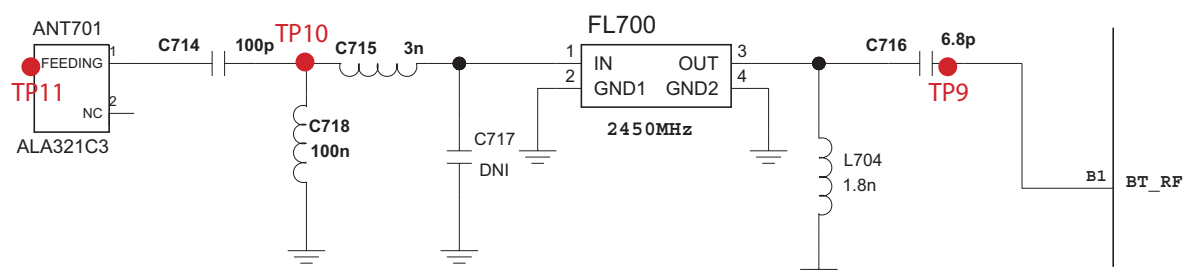
### 4.13.2.3 Check the Signal path

- There are a filter, matching circuit and BT antenna in the BT signal path. The filter is for noise and spurious suppression. BT antenna is multilayer chip type

#### Board Picture



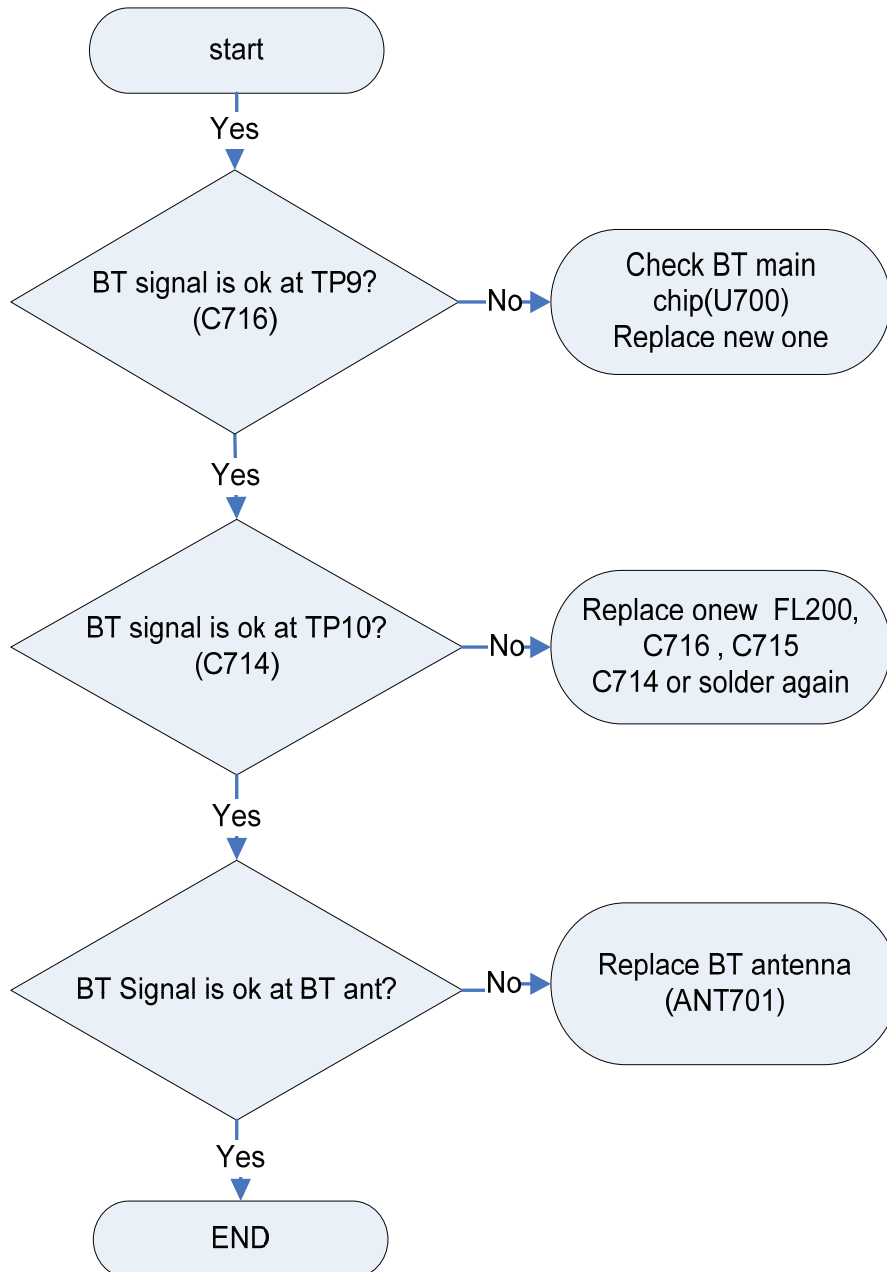
#### Circuit Diagram



## 4. TROUBLE SHOOTING

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### Check flow

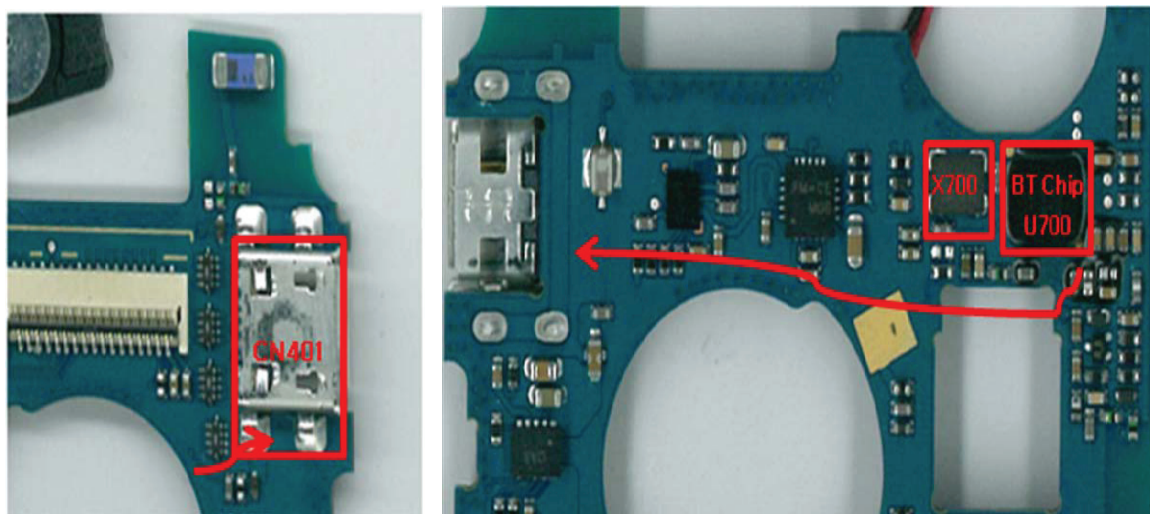


### 4.14 FM Trouble

- FM Radio consists of two paths. One is for Ear jack, the other FM Intenna. As for FM intenna path, There is FM LNA that improve FM sensitivity

#### 4.14.1 FM Component & Signal Path

##### - EARJACK PATH



##### - FM INTENNA PATH

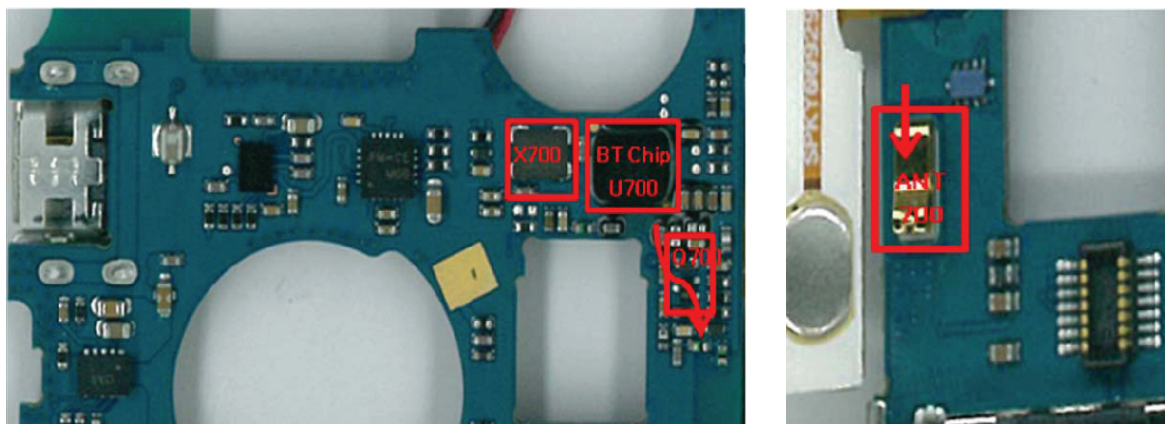


TABLE 4.14.1

Reference	Description
U700	BT/FM MAIN CHIP
X700	BT XO(26MHZ)
Q700	FM LNA
ANT700	FM ANTENNA

## 4. TROUBLE SHOOTING

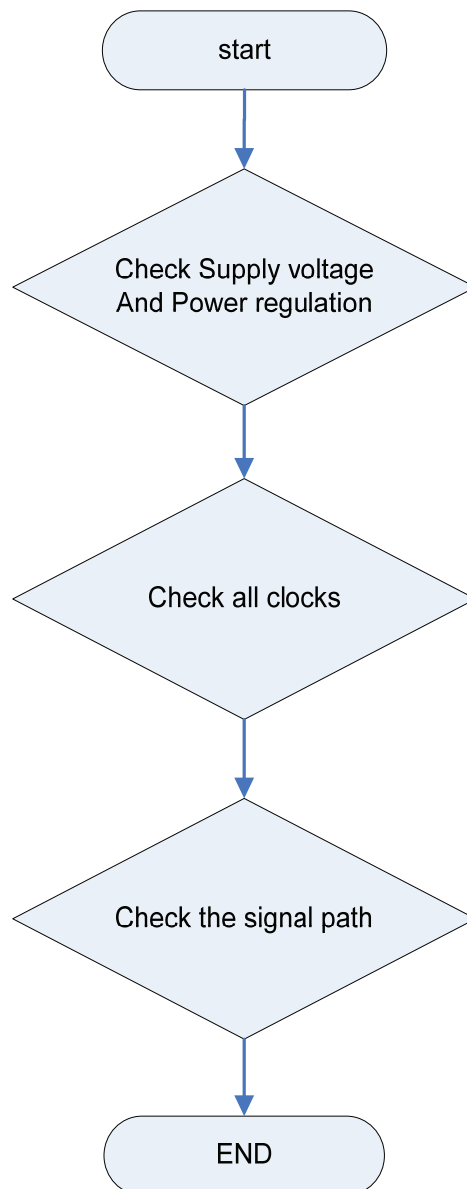
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### 4.14.2 FM Radio function has trouble while plugging Ear jack

- Please follow the below process

1. Check the FM Power Regulation and Supply voltage
2. Check the Clock
3. Check the signal path

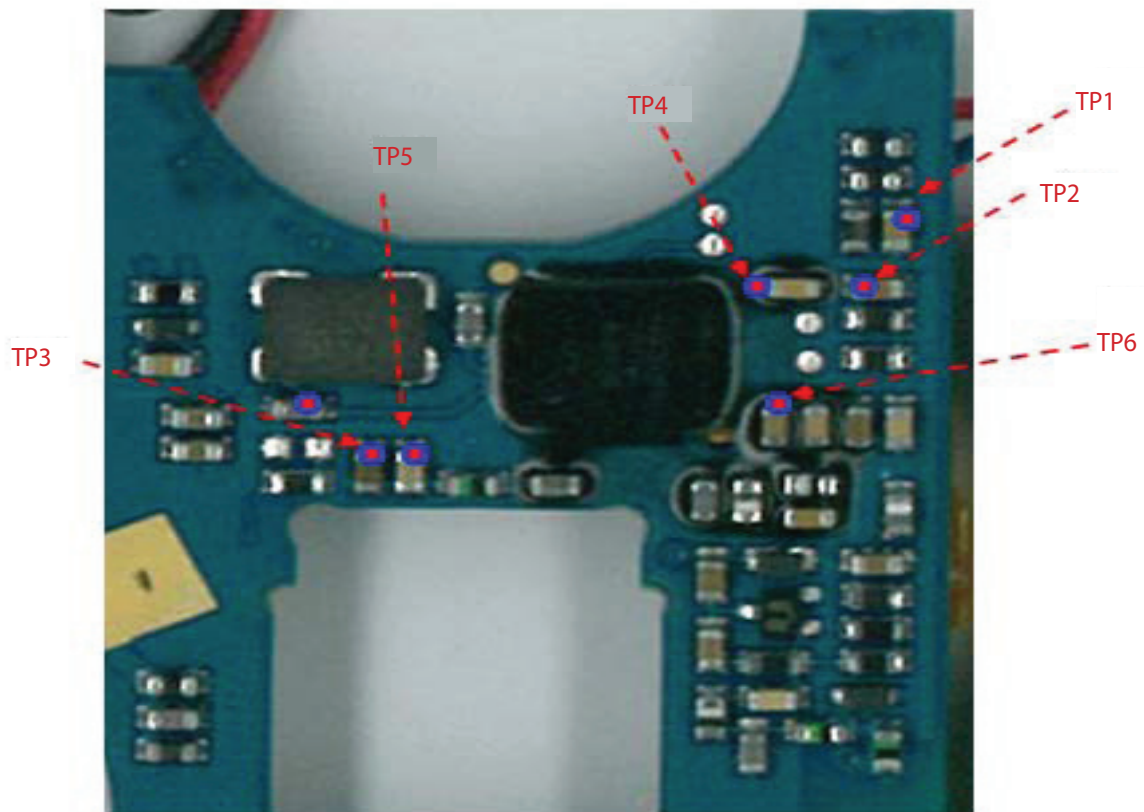
**Checking flow**



### 4.14.2.1 Check the FM Power Regulation and Supply voltage

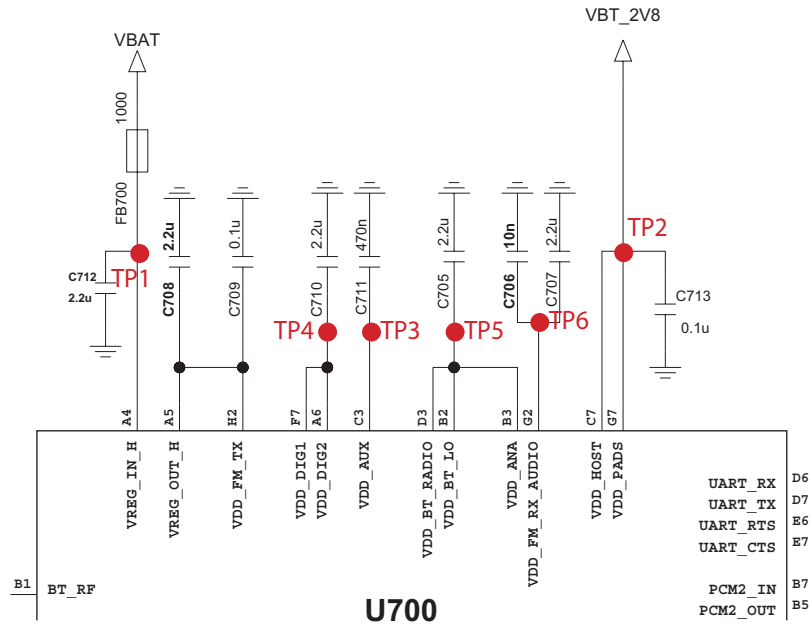
- FM(BT) Chip has two supply voltage and Power regulator

#### Board Picture

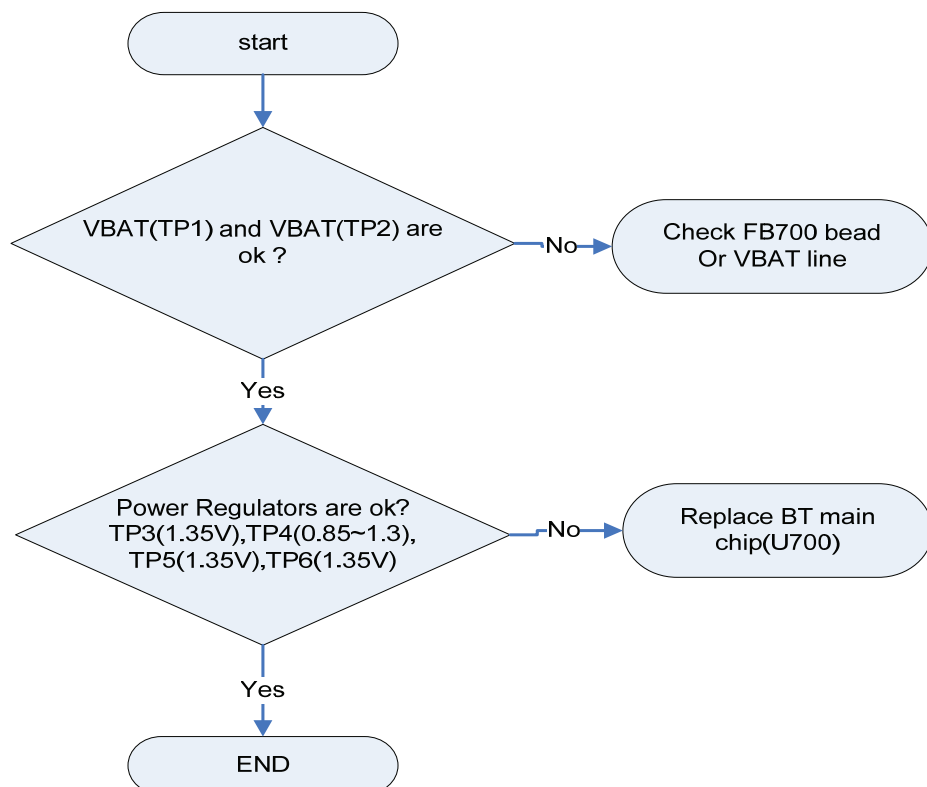


## 4. TROUBLE SHOOTING

### Circuit Diagram



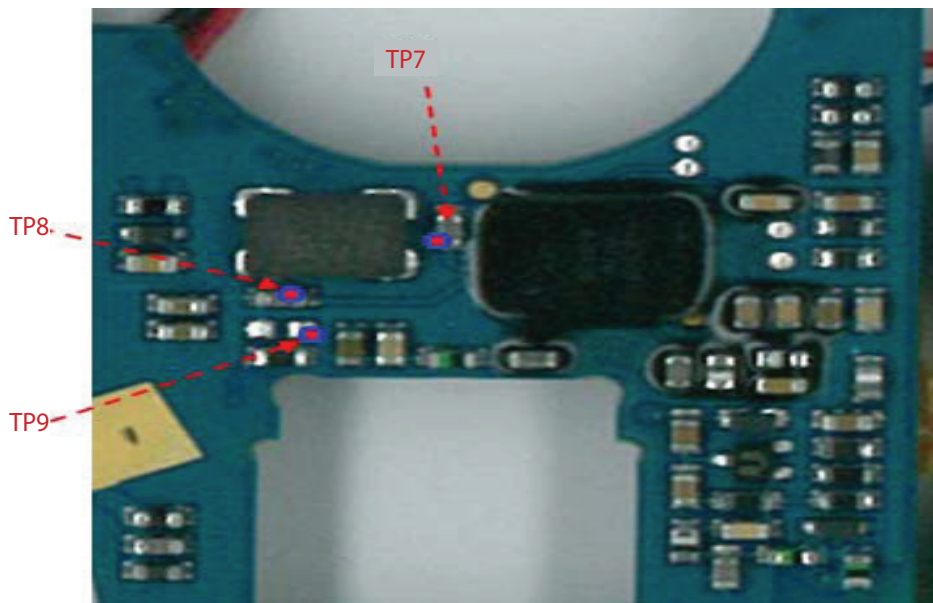
### Check flow



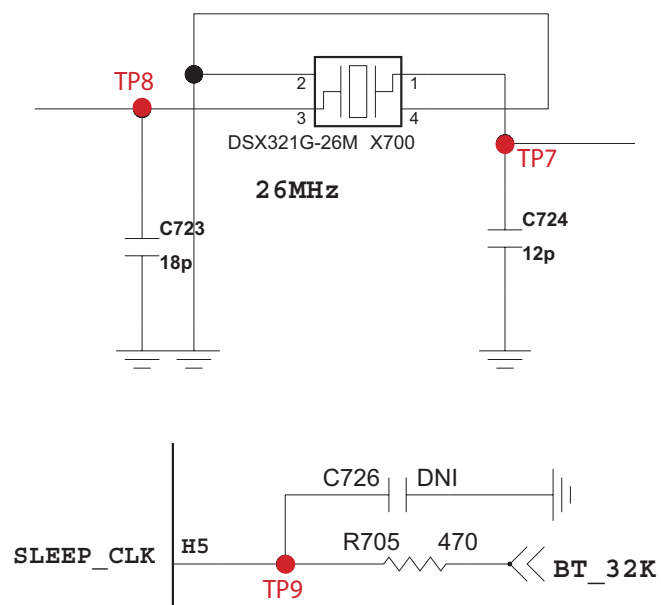
### 4.14.2.2 Check the Clock

- FM (BT) Chip consists of two kinds of clock. One is sys clock(26M) that come from the external XO and the other is sleep clock(32khz) from MTK chip

#### Board Picture



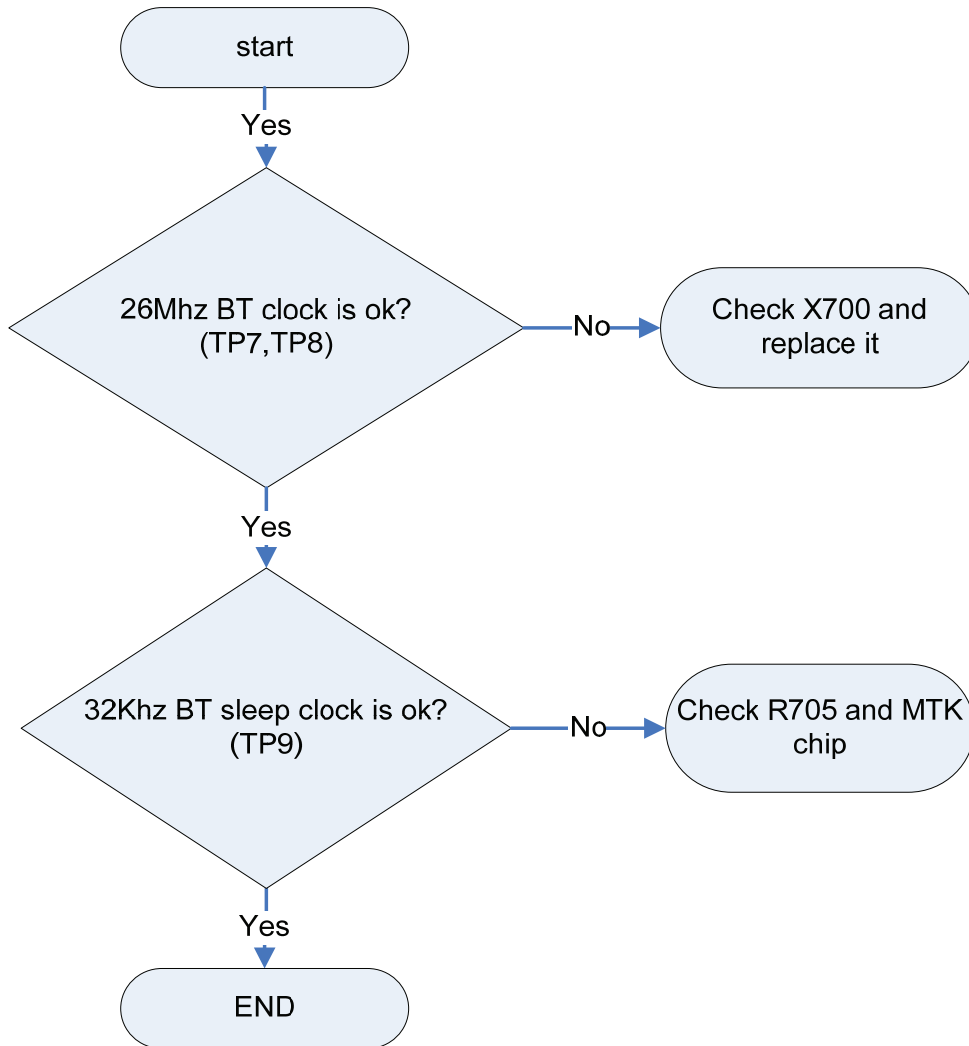
#### Circuit Diagram



## 4. TROUBLE SHOOTING

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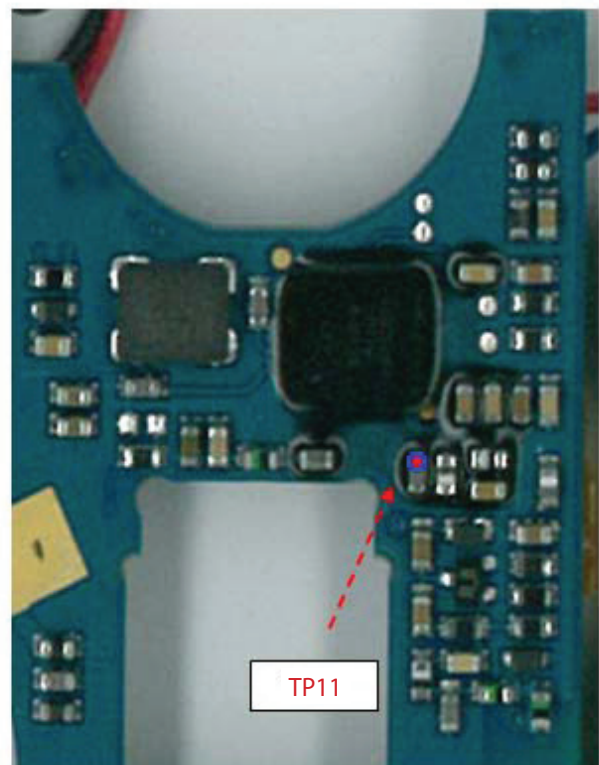
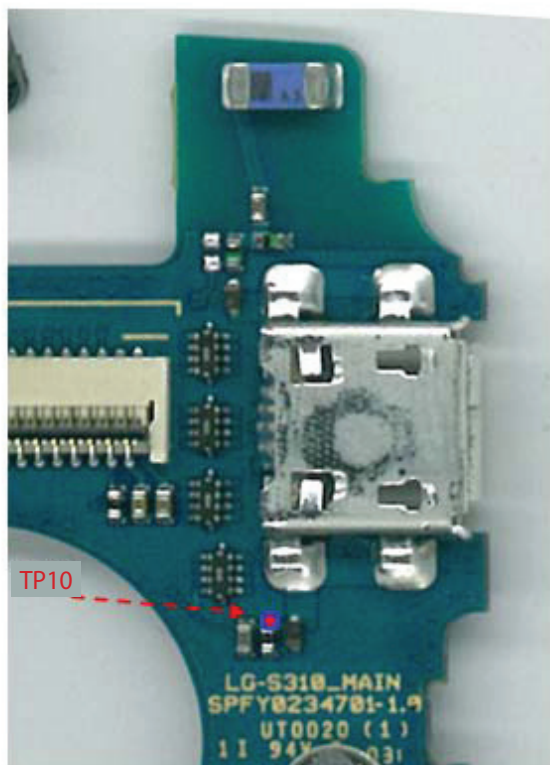
### Check flow



### 4.14.2.3 Check the FM signal path

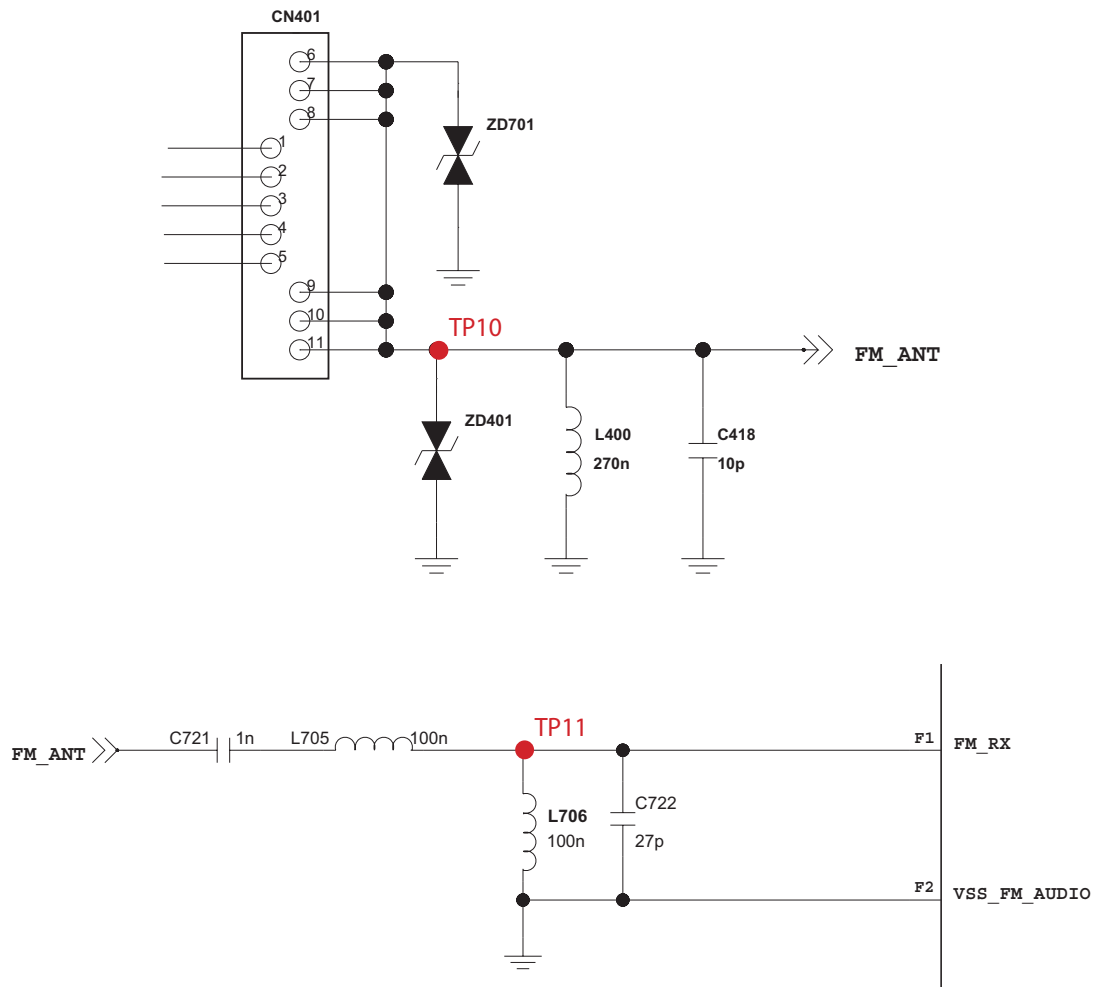
- FM has two signal path. One is for Earjack. The last is for FM antenna. On the section, We deal with Earjack path.

#### Board Picture

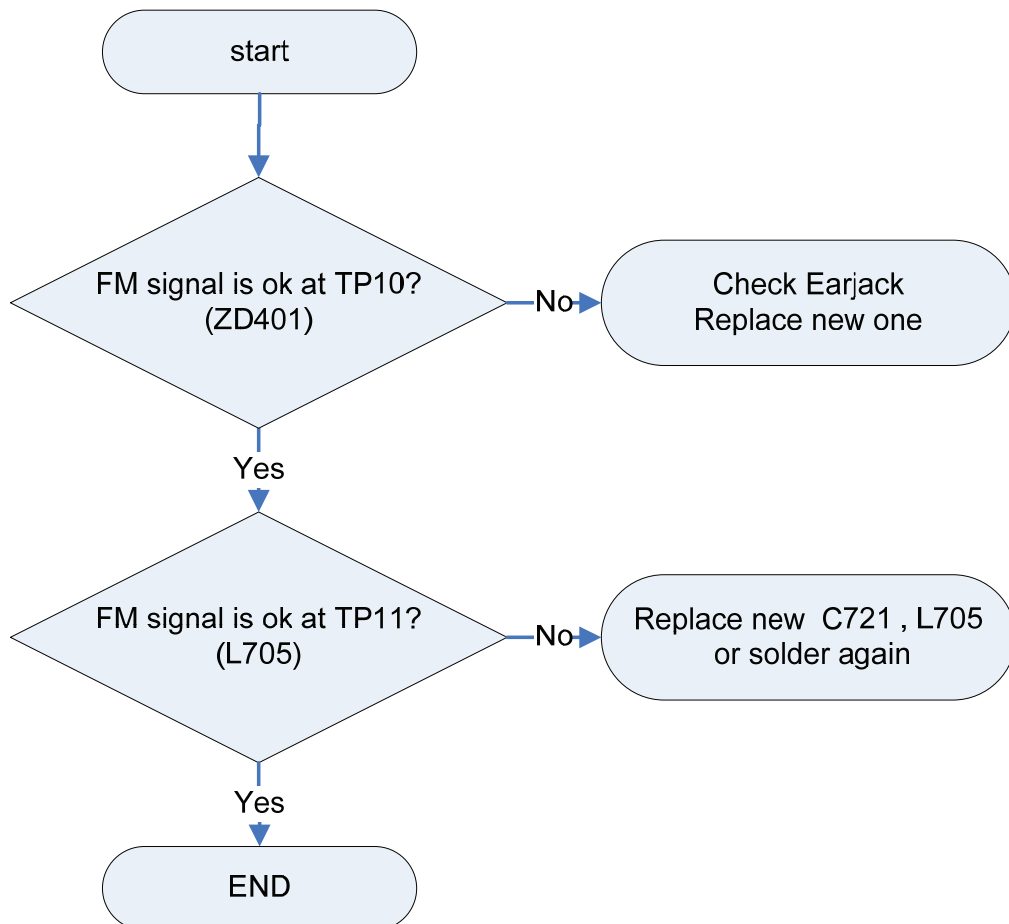


## 4. TROUBLE SHOOTING

### Circuit Diagram



### Check flow



## 4. TROUBLE SHOOTING

---

### 4.14.3 FM Radio function has trouble without plugging Ear jack

- Please follow the below process

1. Check the FM Power Regulation and Supply voltage
2. Check the Clock
3. Check the signal path

#### 4.14.3.1 Check the FM Power Regulation and Supply voltage

- Refer to 5.14.2.1

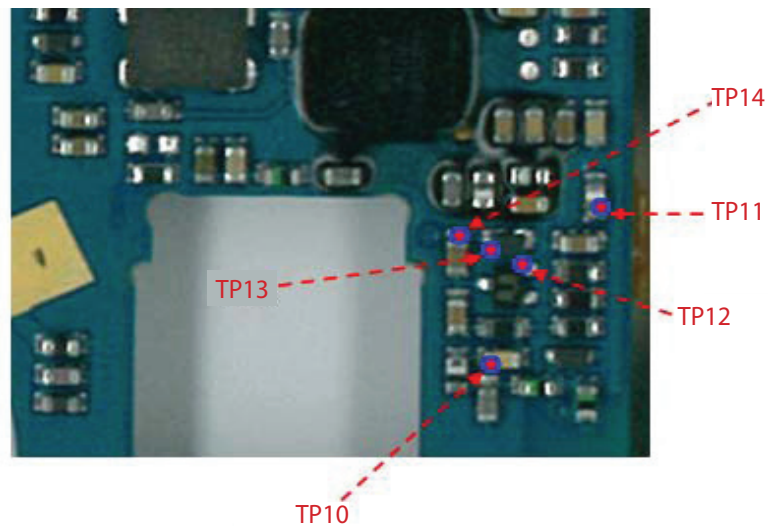
#### 4.14.3.2 Check the Clock

- Refer to 5.14.2.2

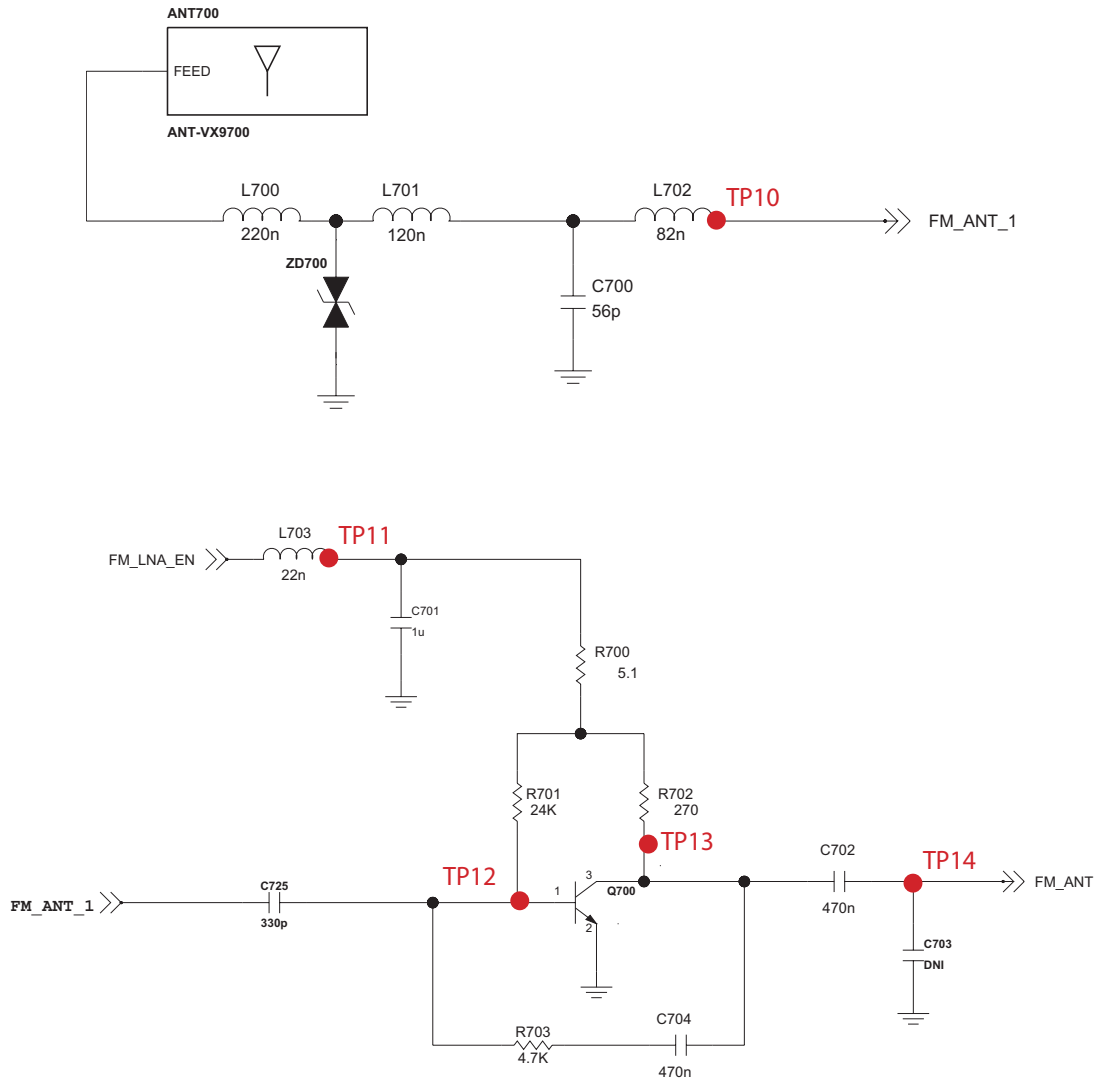
#### 4.14.3.3 Check the FM signal path

- FM has two signal path. One is for Earjack. The last is for FM intenna. On the section,  
We deal with FM Intenna path.

#### Board Picture

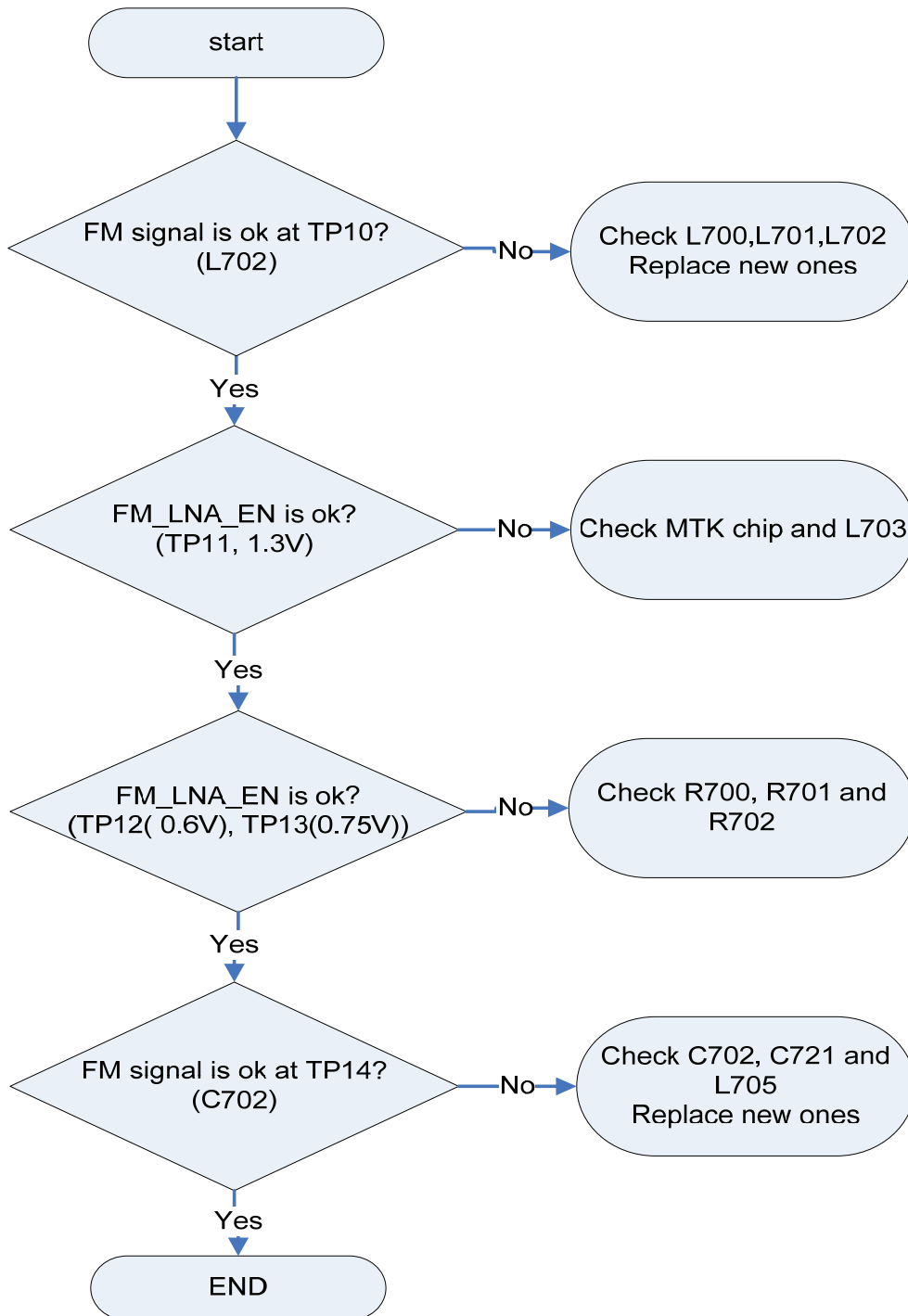


### Circuit Diagram



## 4. TROUBLE SHOOTING

### Check flow



## 4.15 RF Trouble Shooting

### 4.15.1 RF Component

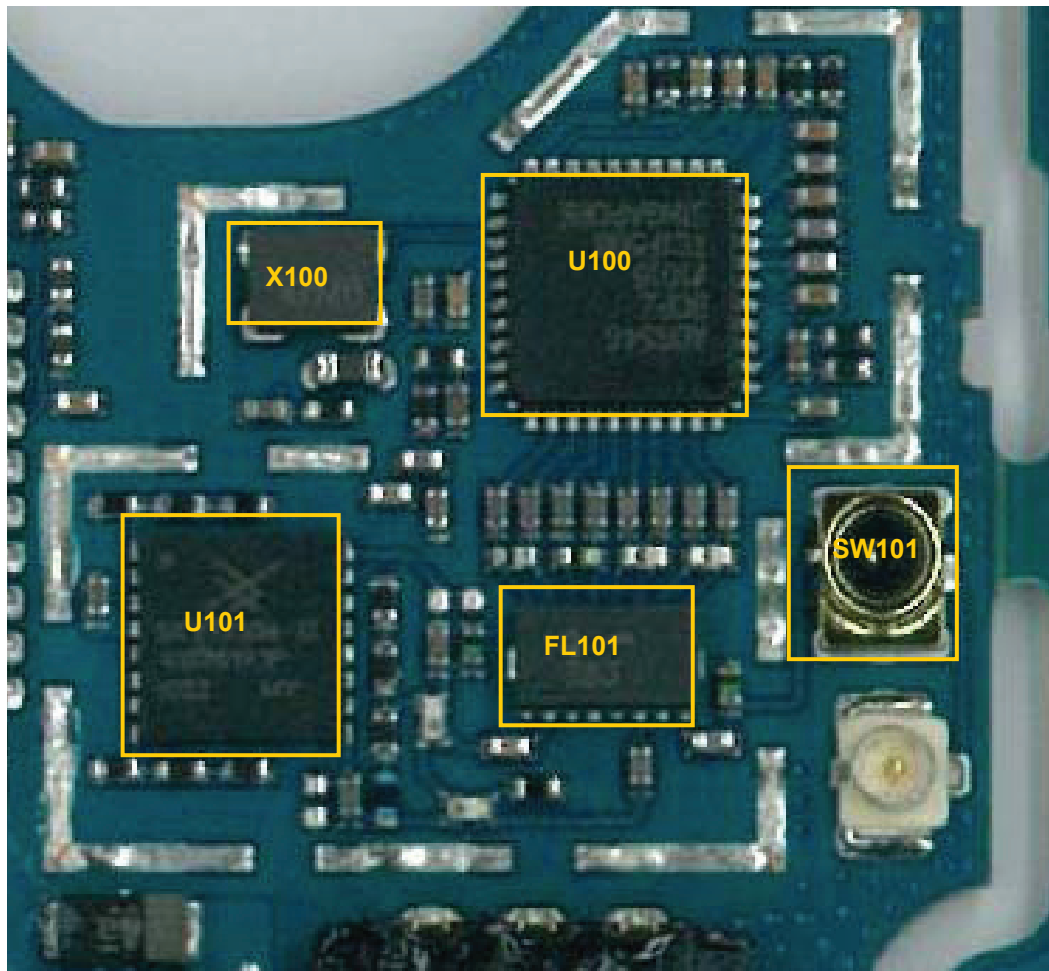


Figure 4.15.1 RF Block Component

Table 4.15.1 Part Description

Reference	Description
U100	GSM RF Transceiver
U101	GSM Quad EDGE PAM
FL101	Front End Module
X100	26MHz Crystal
SW101	Mobile Switch

## 4. TROUBLE SHOOTING

### 4.15.2 Signal Path

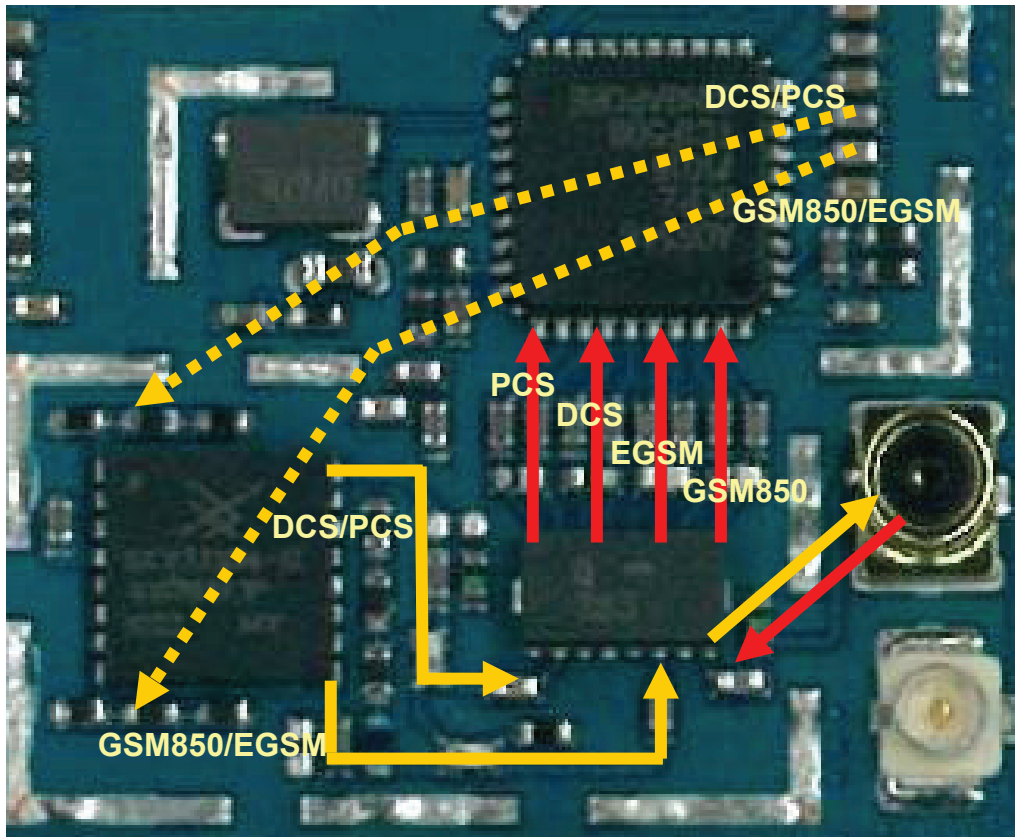


Figure 4.15.2 GSM850/EGSM/DCS/PCS Signal Path

A. Quad Band Rx Path

B. Quad Band Tx Path

### 4.15.3 RF Trouble

#### Check Flow

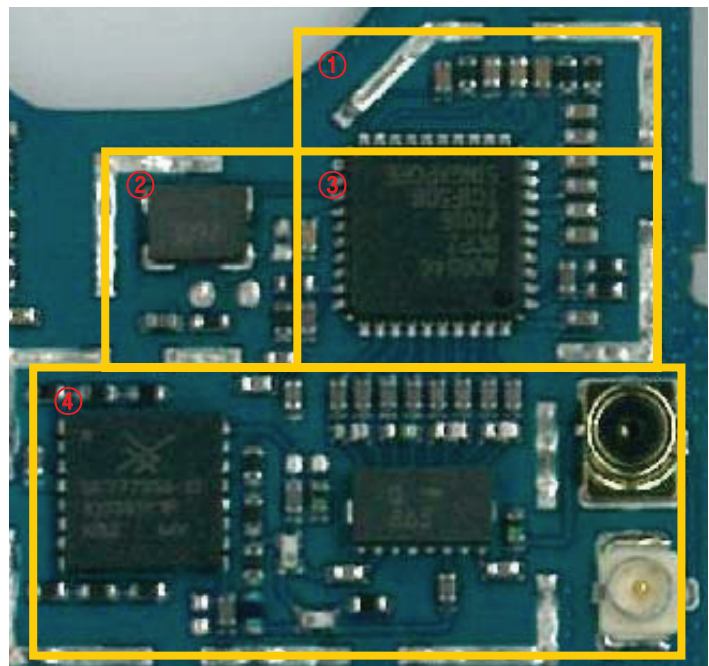
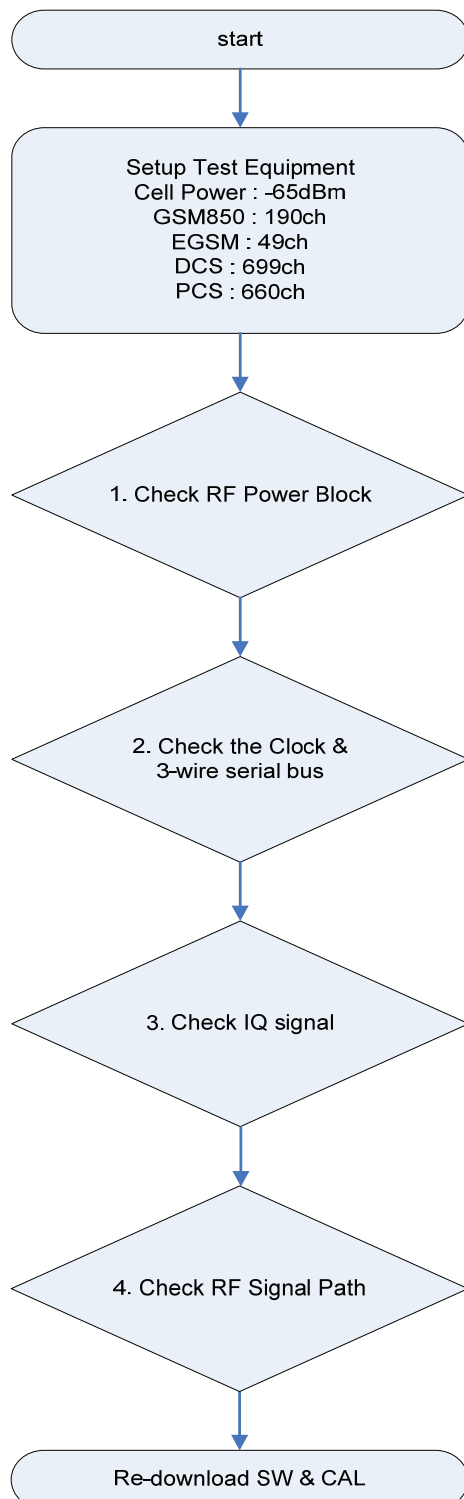


Figure 4.15.3 Checking Block

## 4. TROUBLE SHOOTING

### 4.15.4 Check RF Power Blcok

Check the RF Power Regulation and Supply voltage

-VBAT

-VPM\_RF\_2V8

-AVDD\_2V8

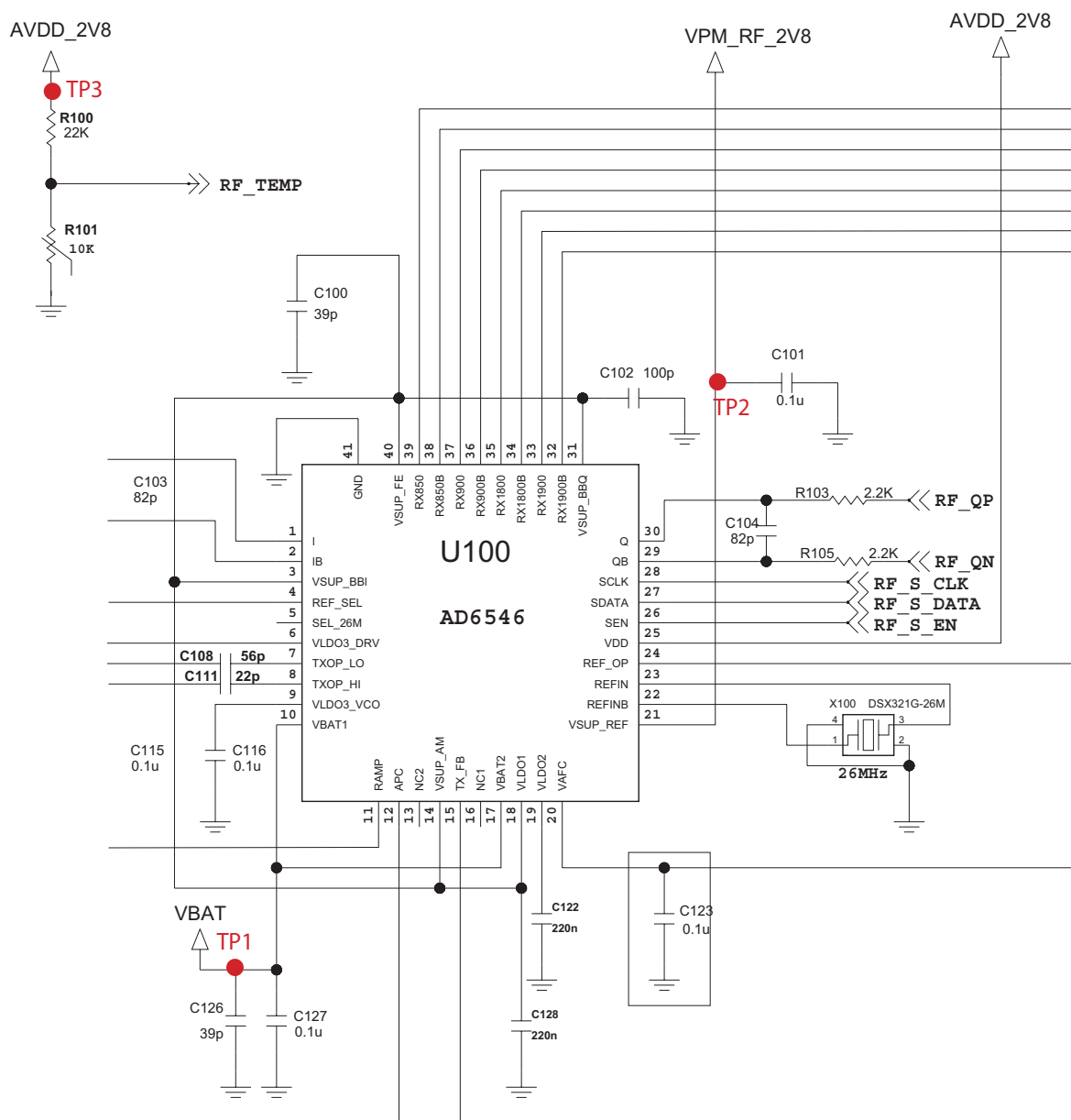


Figure 4.15.4 RF Power Block Circuit

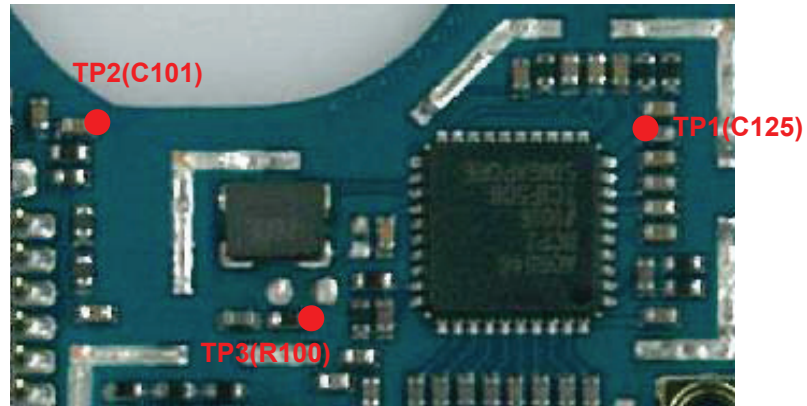
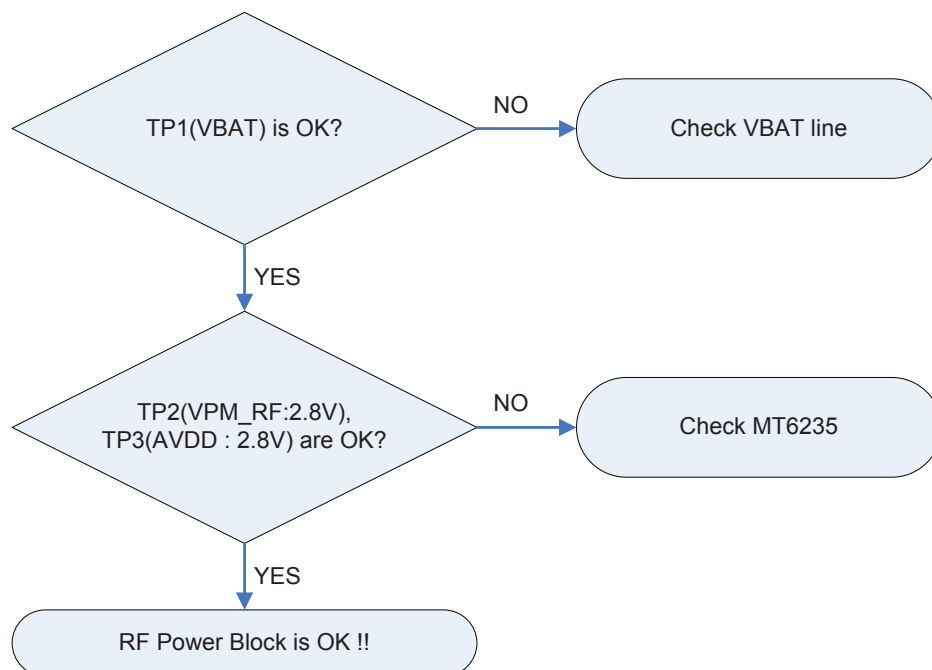


Figure 4.15.5 RF Power Block Checking Points

### Checking Flow



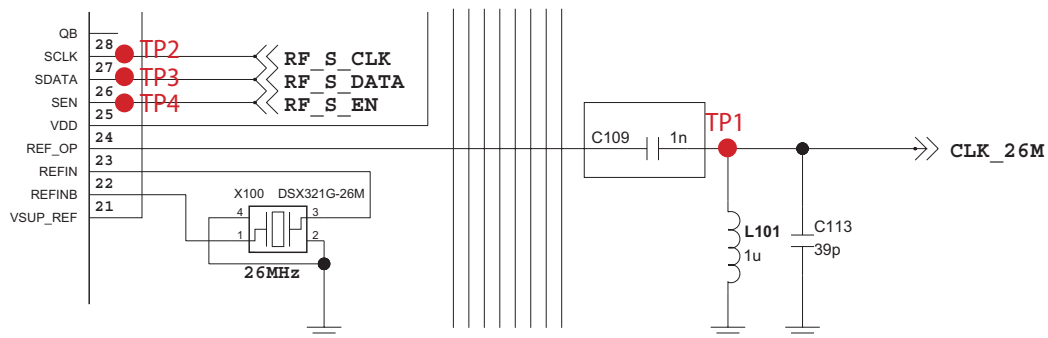
## 4. TROUBLE SHOOTING

### 4.15.5 Check the Clock & control signal

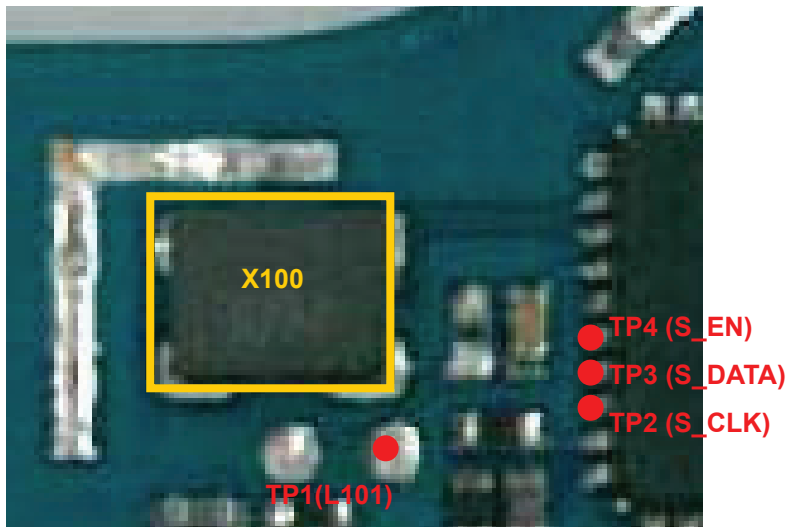
#### Check the Main CLK and 3-wire serial bus

-CLK\_26M

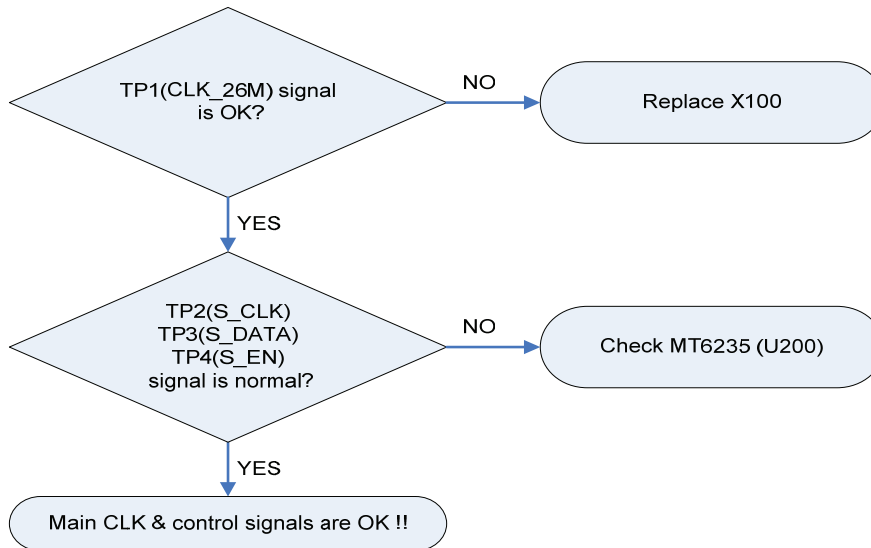
-RF\_S\_CLK/DATA/EN (3-wire serial bus)



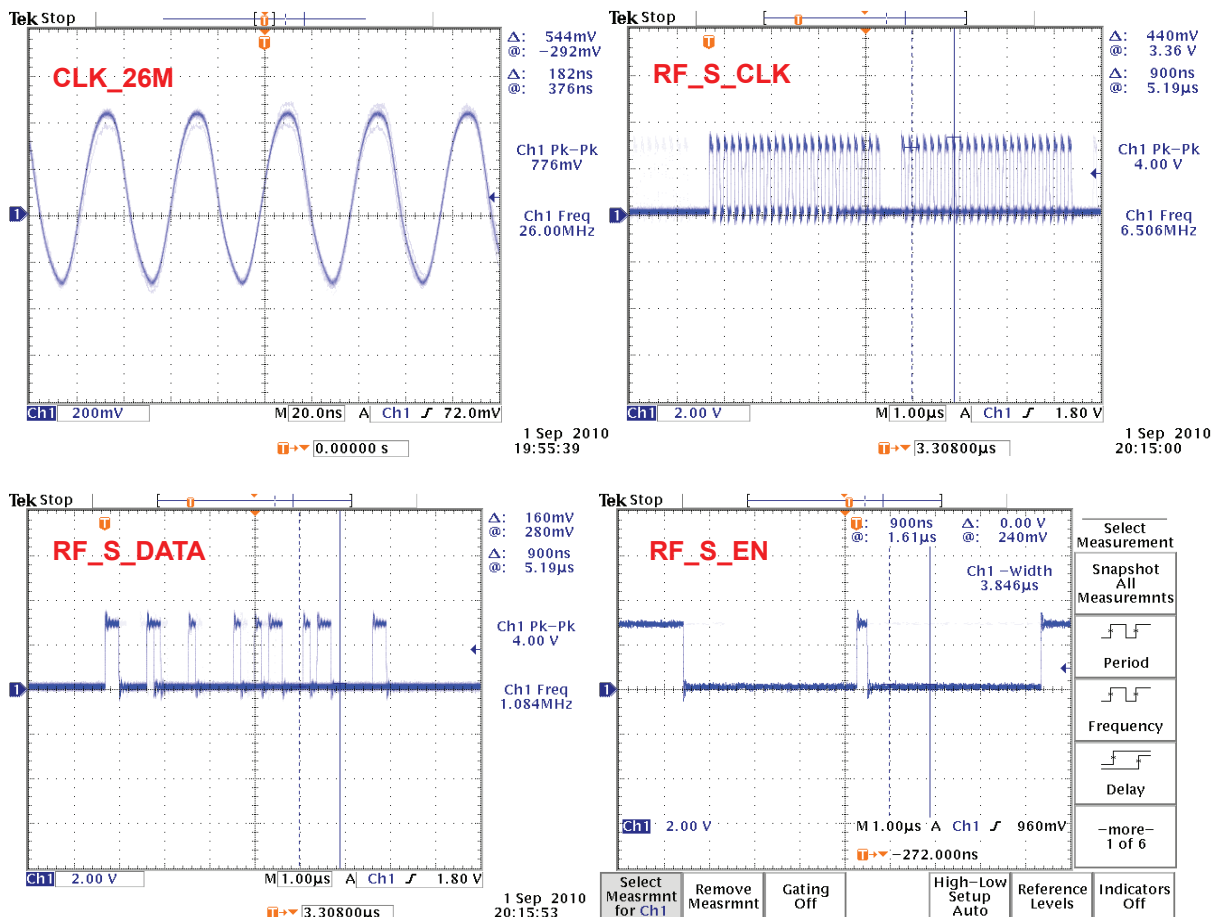
#### Checking Point and Flow



## Checking Flow



## Signal Waveform



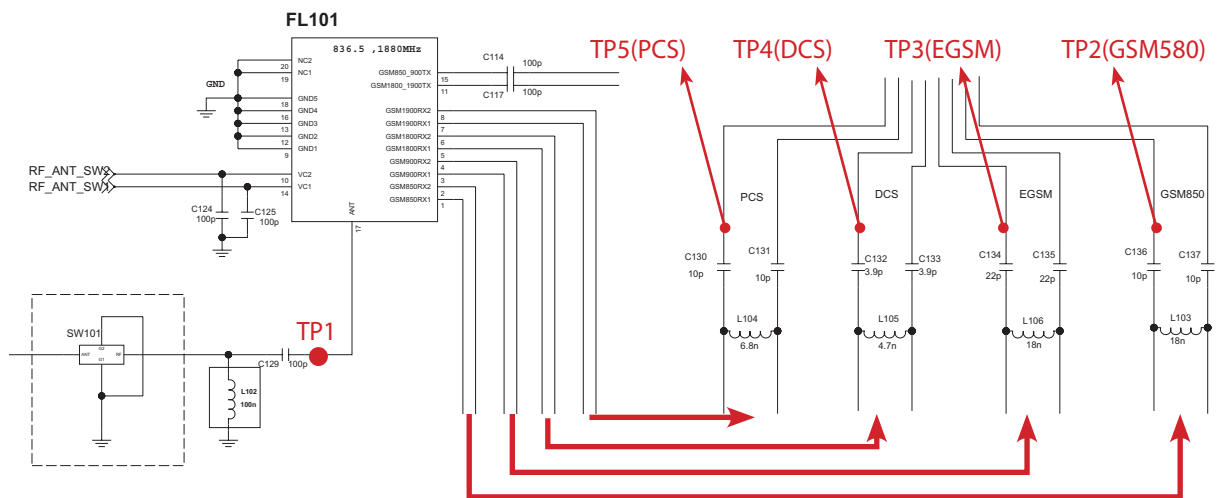


### 4.15.7 Check RF Signal Path – Rx Path

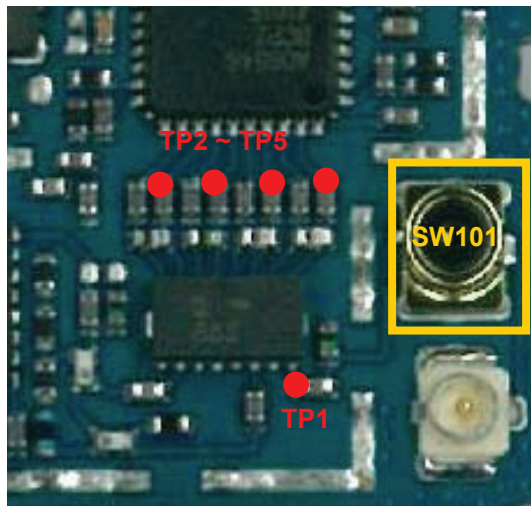
#### Check Rx signal Path

-FEM

-Rx matching component



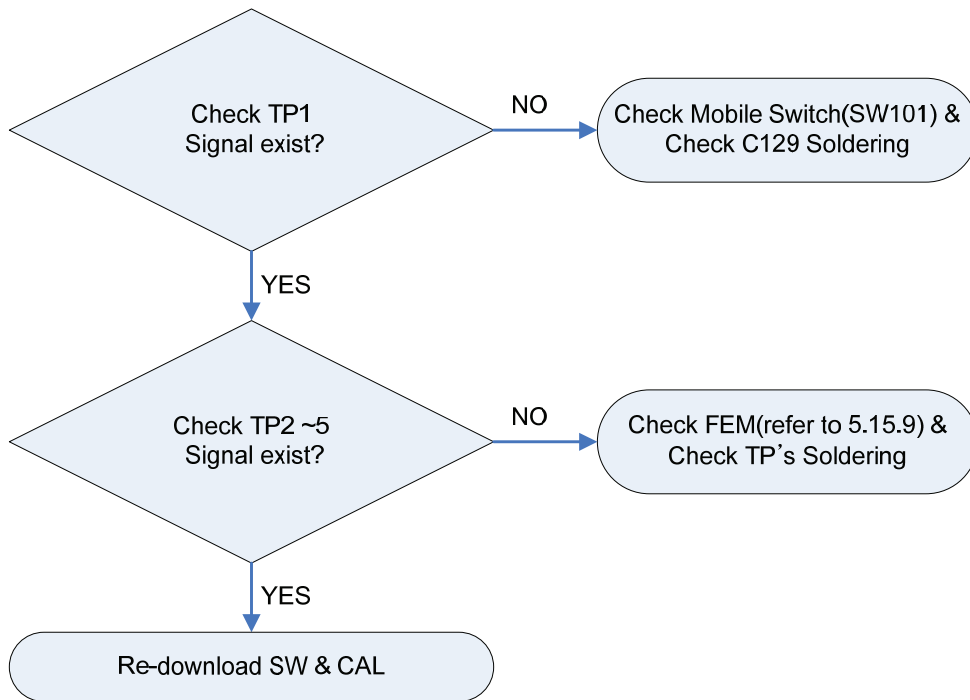
#### Checking Points



## 4. TROUBLE SHOOTING

---

### Checking Flow



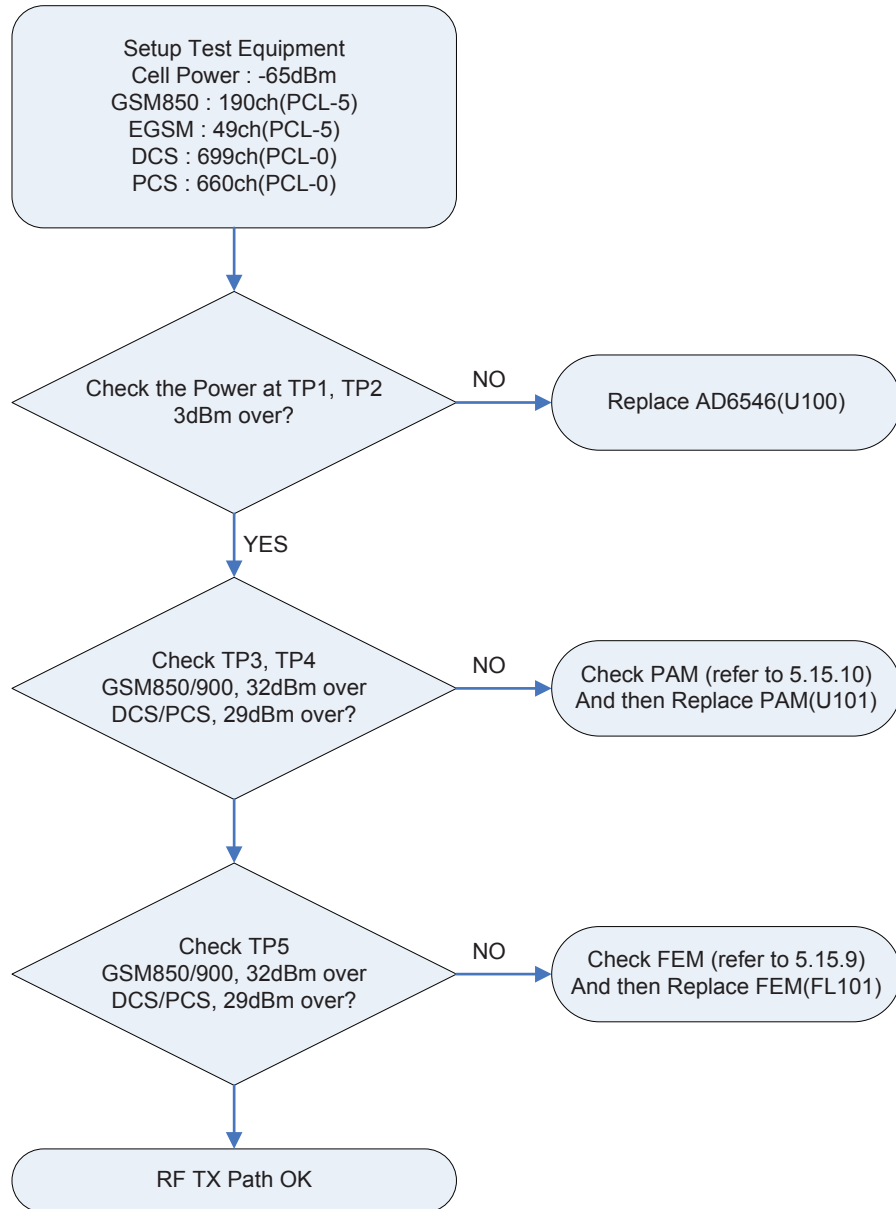
**Check Tx signal Path (AD6546(U100) → GSM PAM(U101) → FEM(FL101))**

-FEM(FL101)



## 4. TROUBLE SHOOTING

### Checking Flow

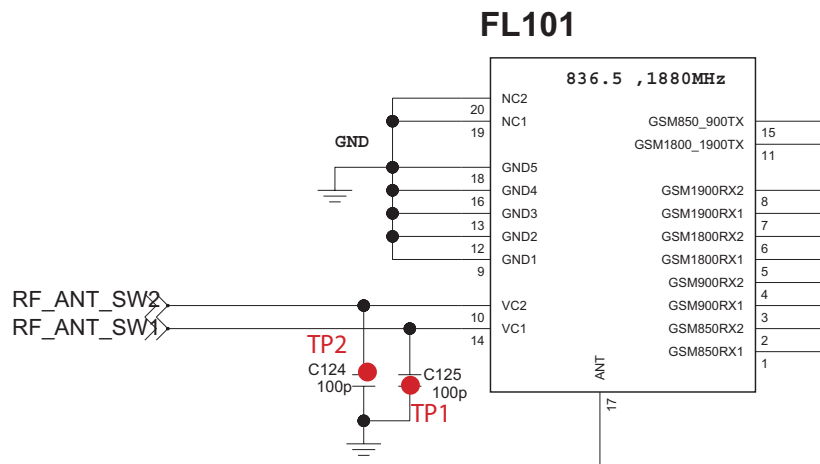


### 4.15.9 Check FEM control signals

#### Check FEM(FL101) control signals

-VC1(RF\_ANT\_SW1)

-VC2(RF\_ANT\_SW1)

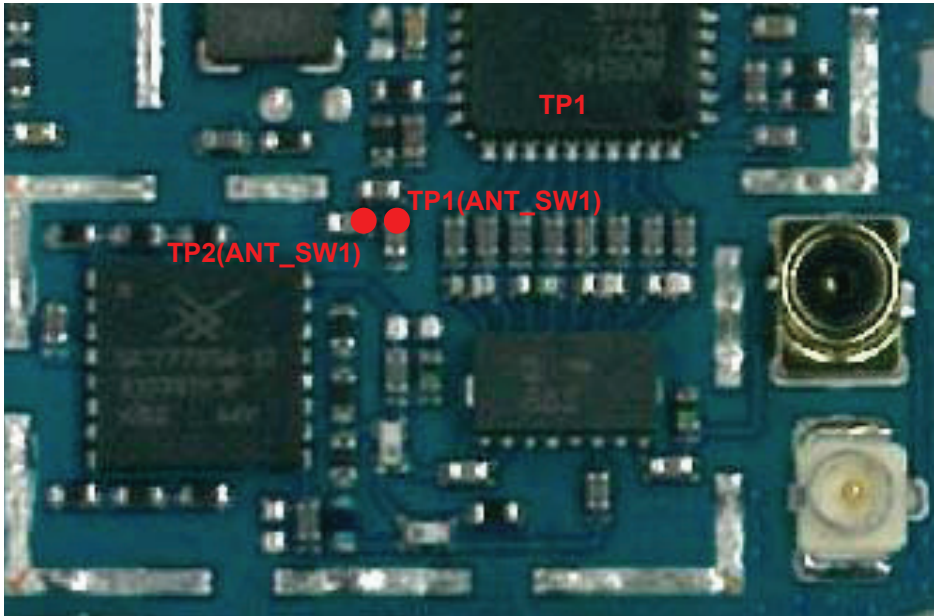


#### FEM Control Logic

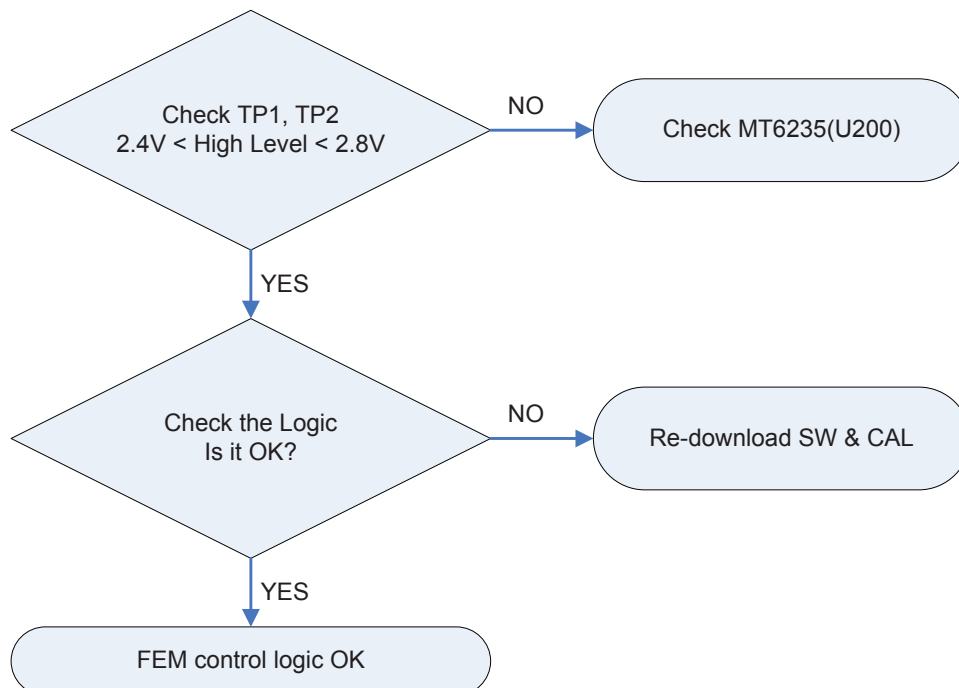
	Vc1(GSM850/900 Tx)	Vc2(GSM1800/1900 Tx)
GSM850 Rx	0.0~0.1 V	0.0~0.1 V
GSM900 Rx	0.0~0.1 V	0.0~0.1 V
GSM1800 Rx	0.0~0.1 V	0.0~0.1 V
GSM1900 Rx	0.0~0.1 V	0.0~0.1 V
GSM850/900 Tx	2.4~2.8 V	0.0~0.1 V
GSM1800/1900 Tx	0.0~0.1 V	2.4~2.8 V

## 4. TROUBLE SHOOTING

### Checking Points

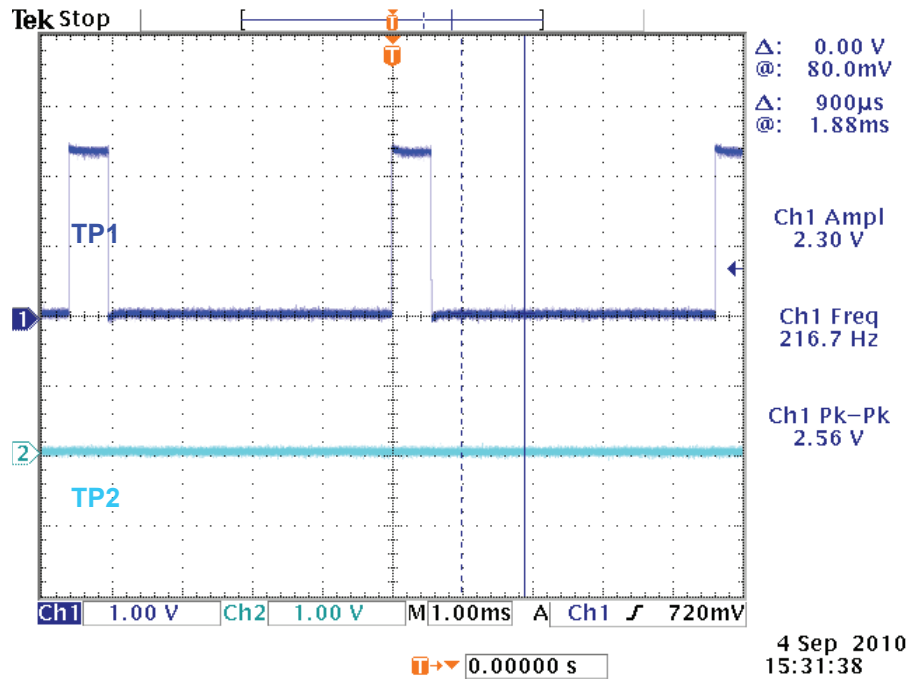


### Checking Flow



## 4. TROUBLE SHOOTING

Signal Waveform (TP1, TP2 at LB call)

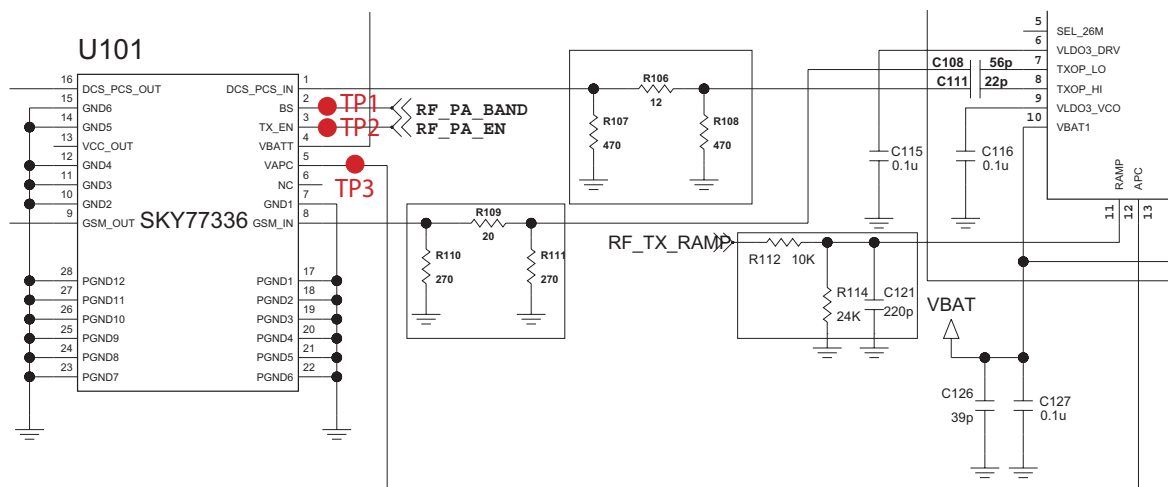


## 4. TROUBLE SHOOTING

### 4.15.10 Check PAM(U101) control signals

#### Check PAM(U101) control Logic

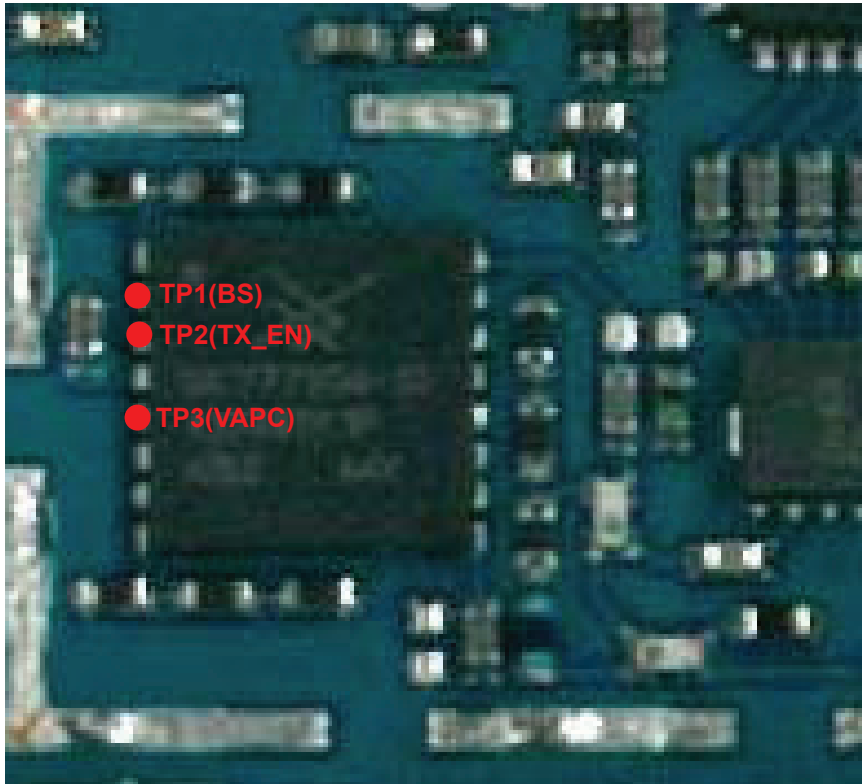
- RF\_PA\_BAND(BS) : Low/High Band selection
- RF\_PA\_EN(TX\_EN) : PA enable
- VAPC : PA output Power control signal



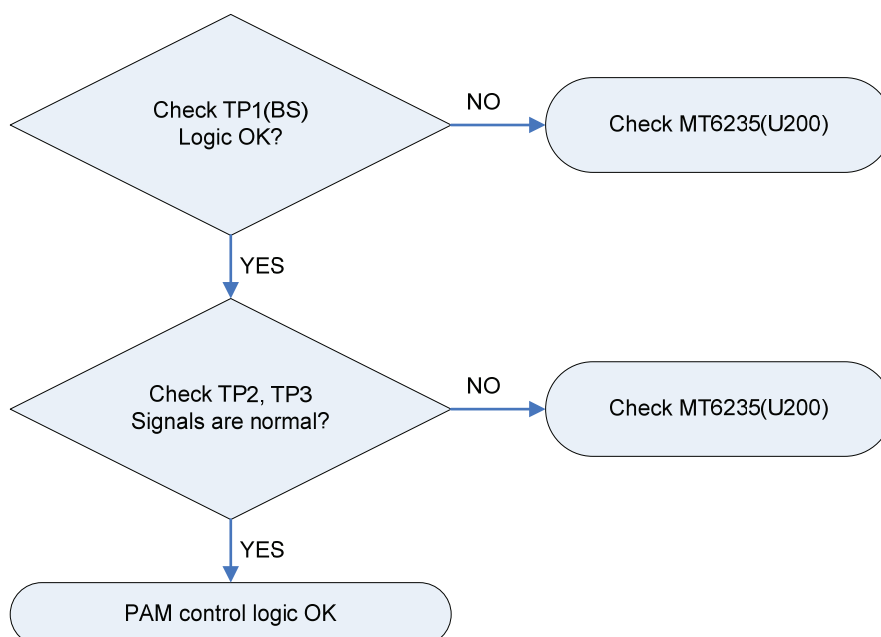
#### PAM(U101) control Logic

Mode	Input Control Bits		850/EGSM Tx	DCS/PCS Tx
	Tx_EN	BS		
Standby	0	X	Disable	Disable
Tx 850/EGSM	1	0	Enable	Disable
Tx DCS/PCS	1	1	Disable	Enable

### Checking points and Flow

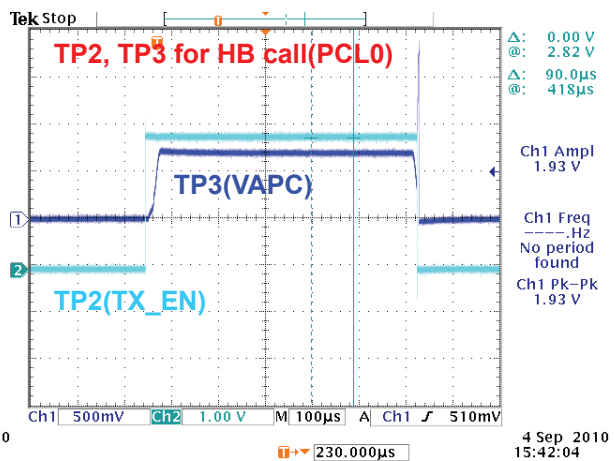
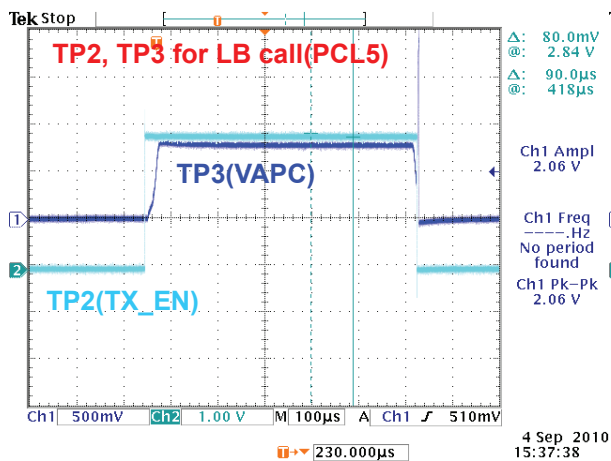
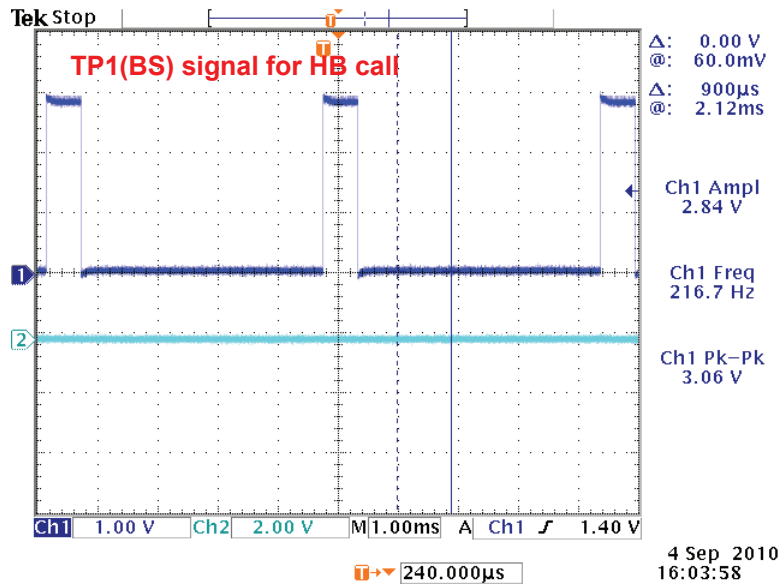


### Checking Flow

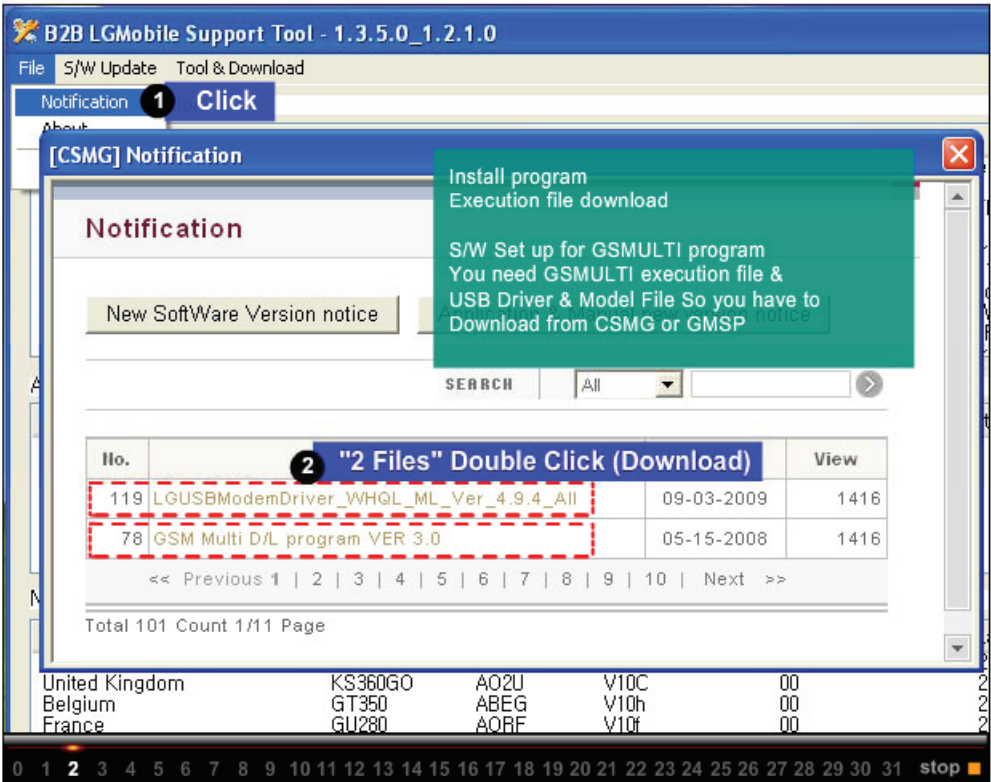
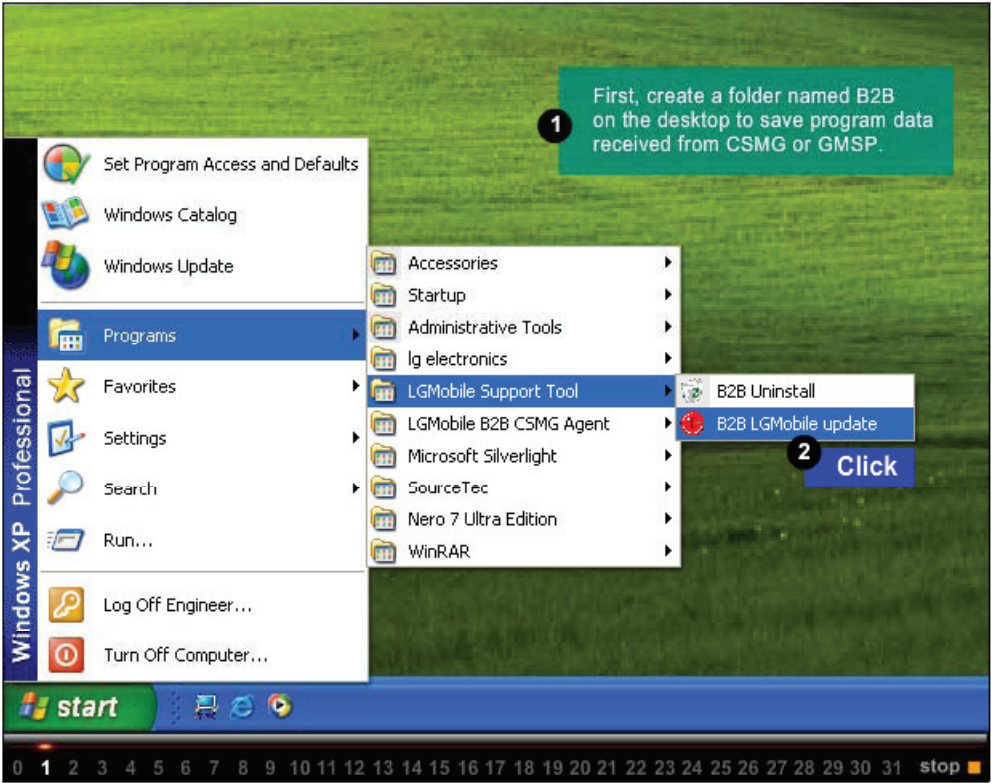


## 4. TROUBLE SHOOTING

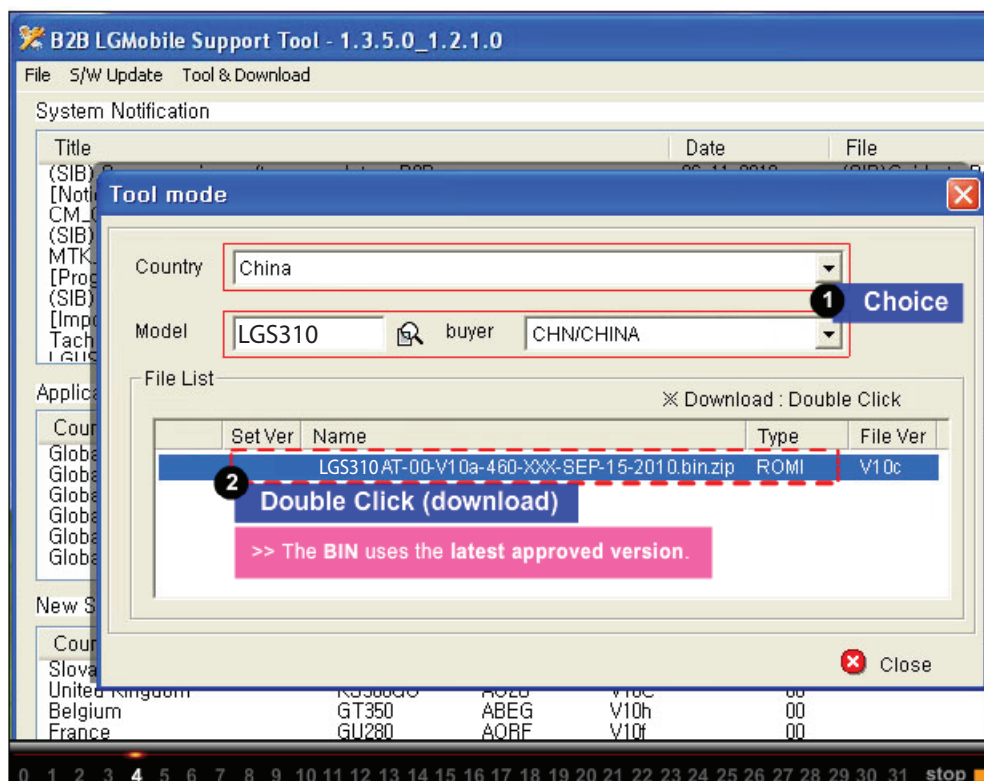
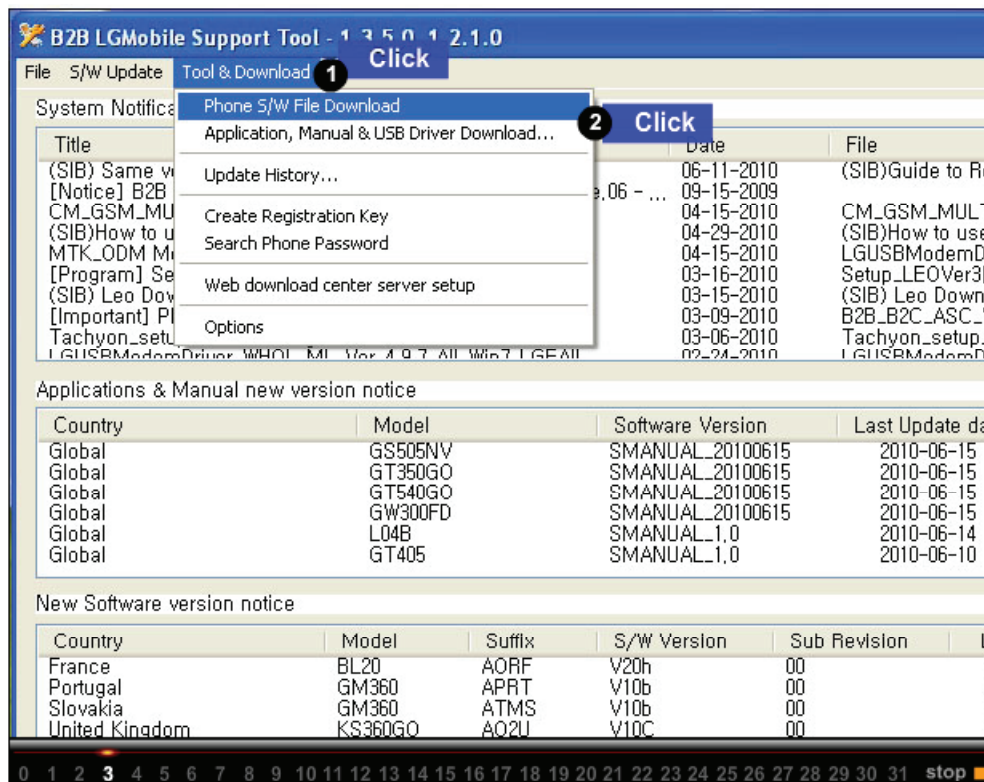
### Signal Waveform



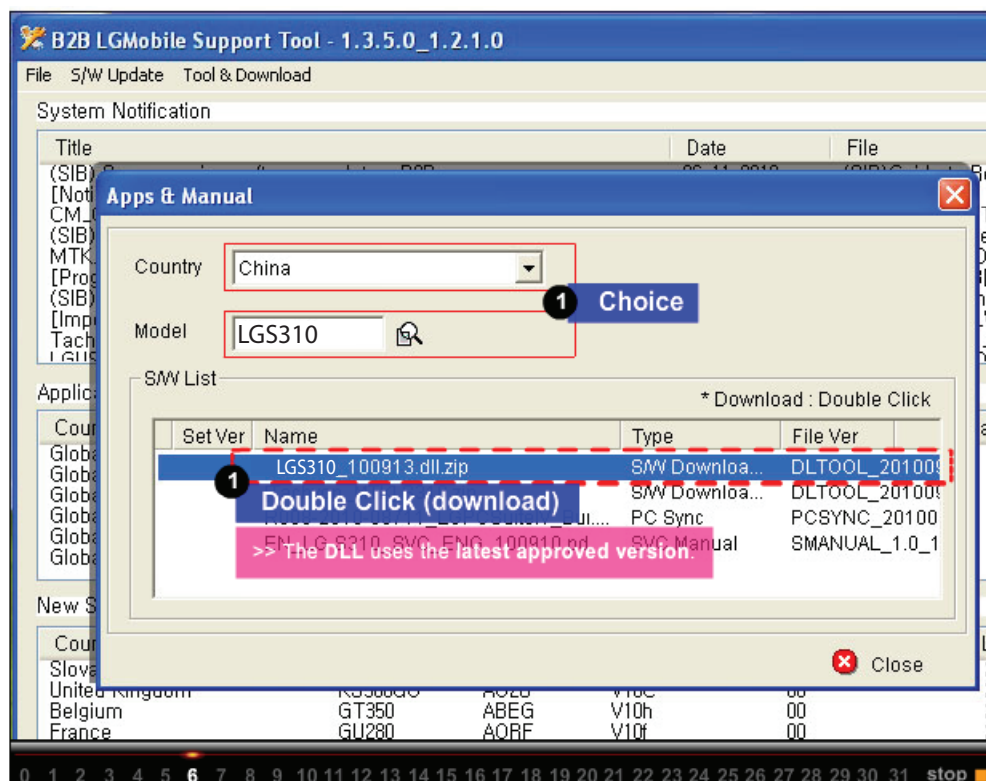
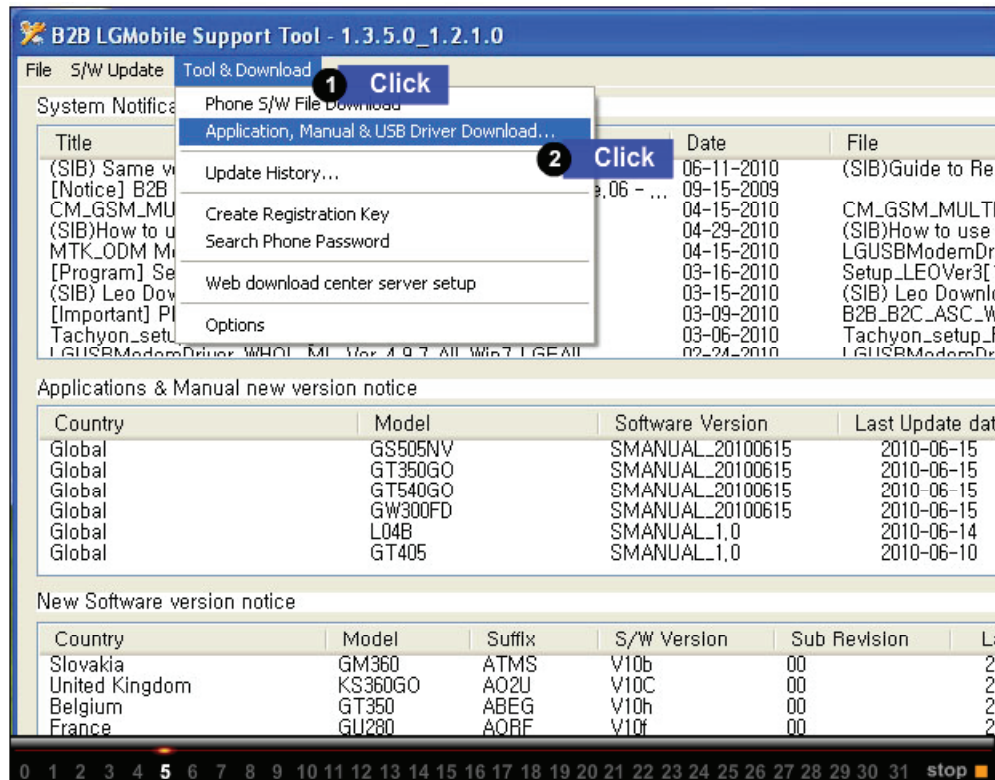
5. DOWNLOAD



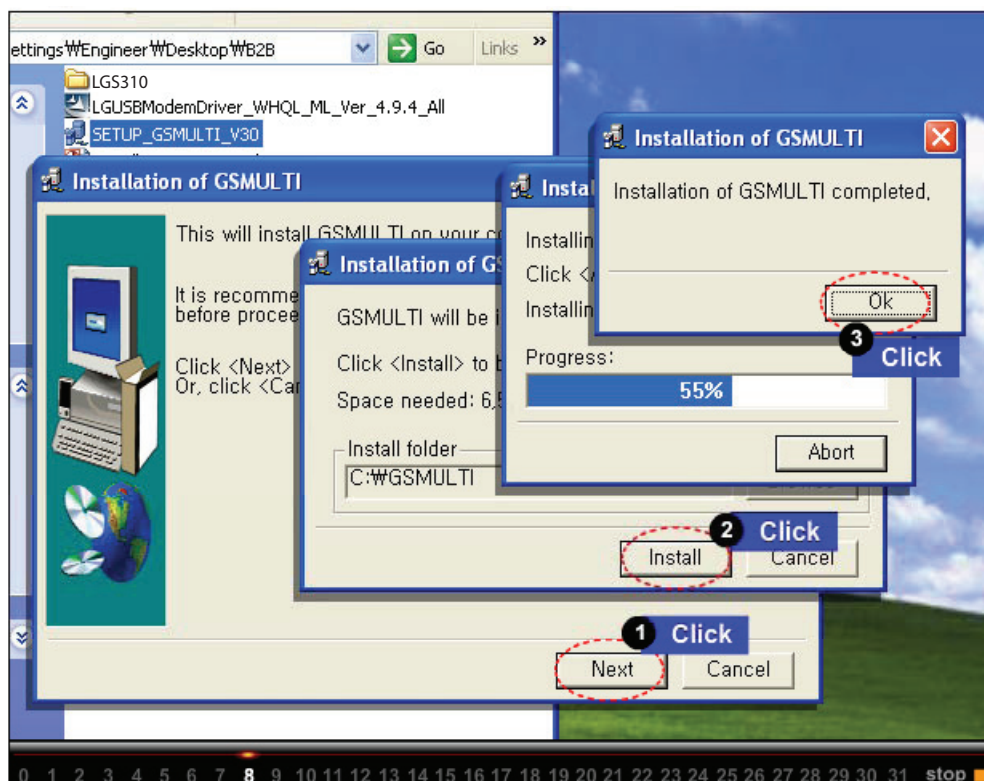
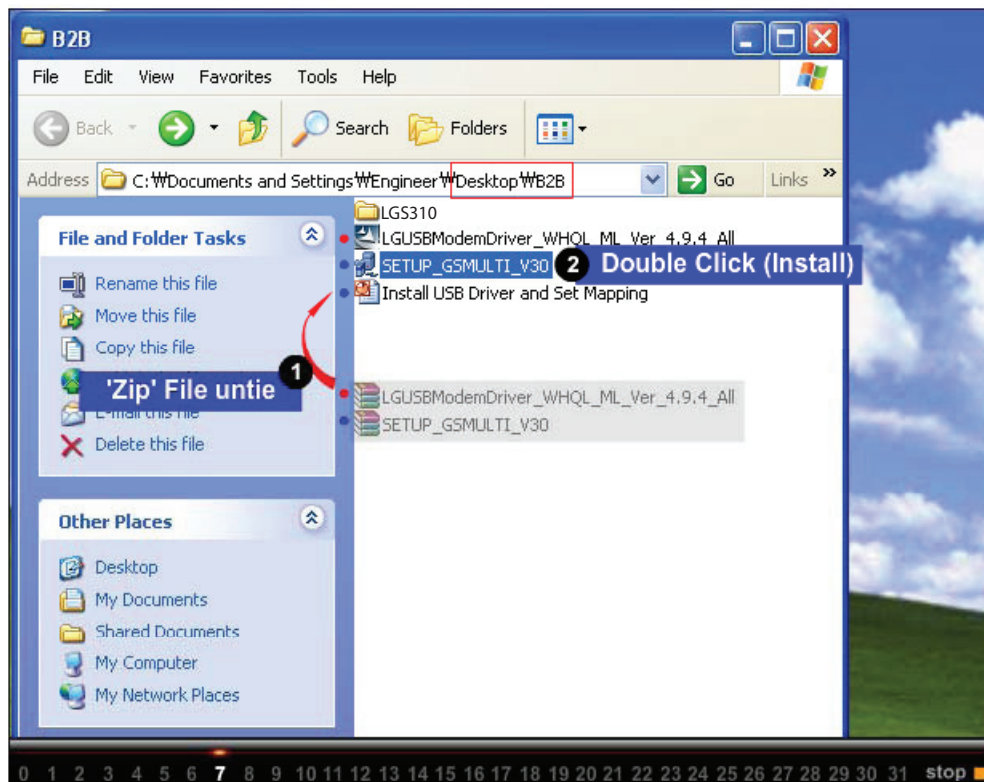
## 5. DOWNLOAD



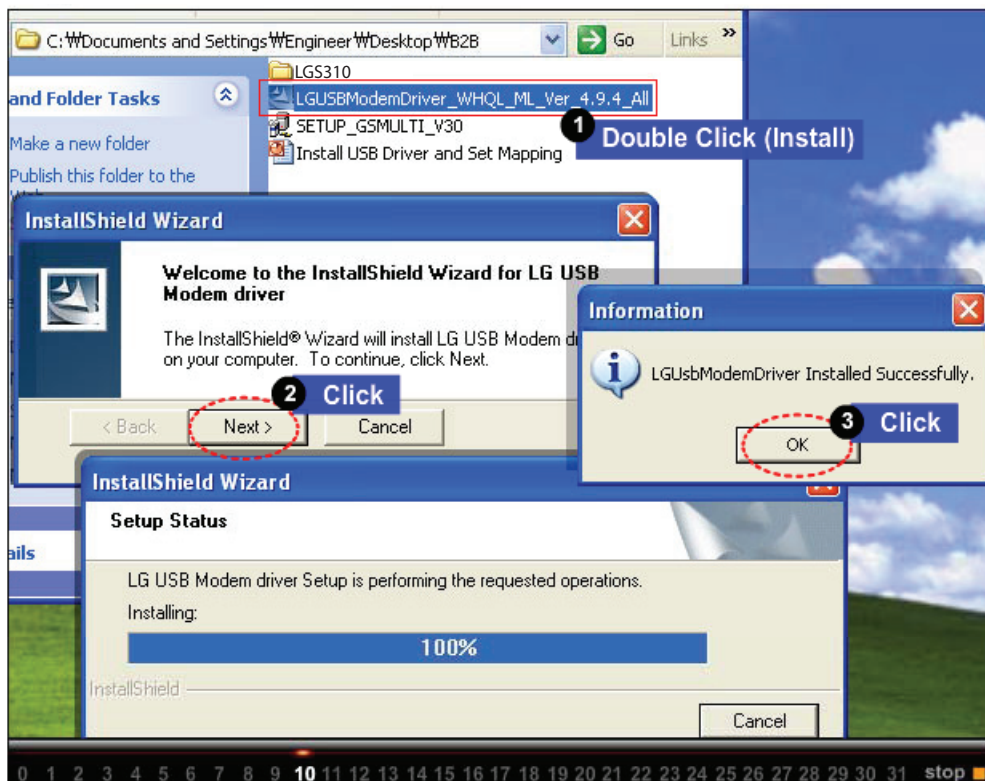
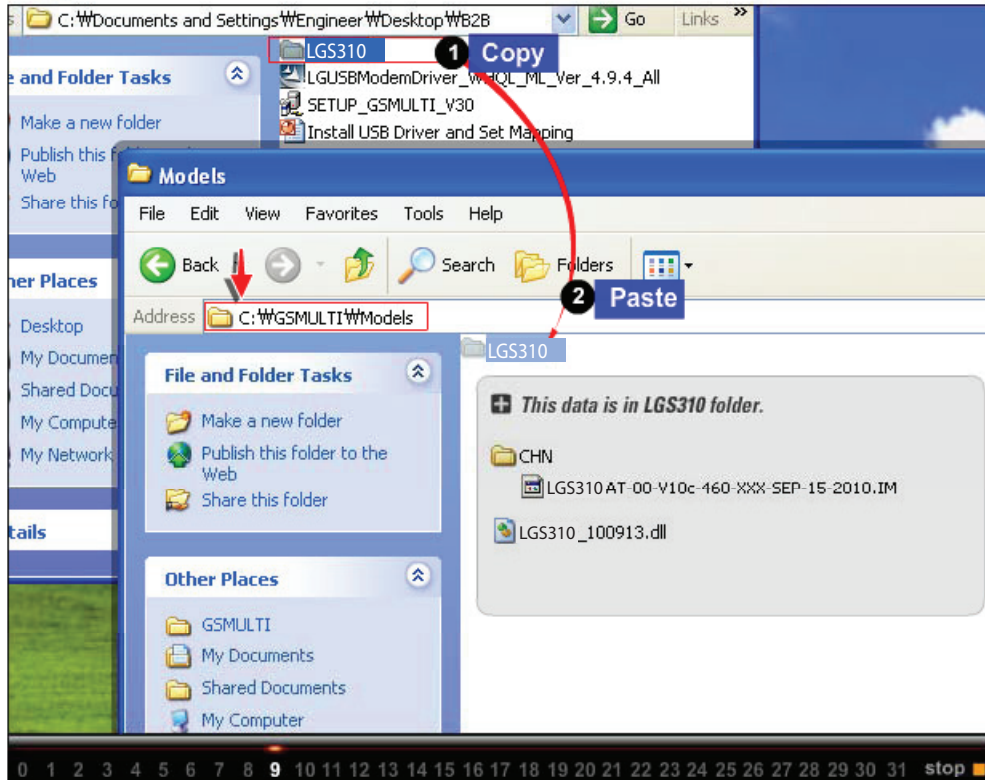
## 5. DOWNLOAD



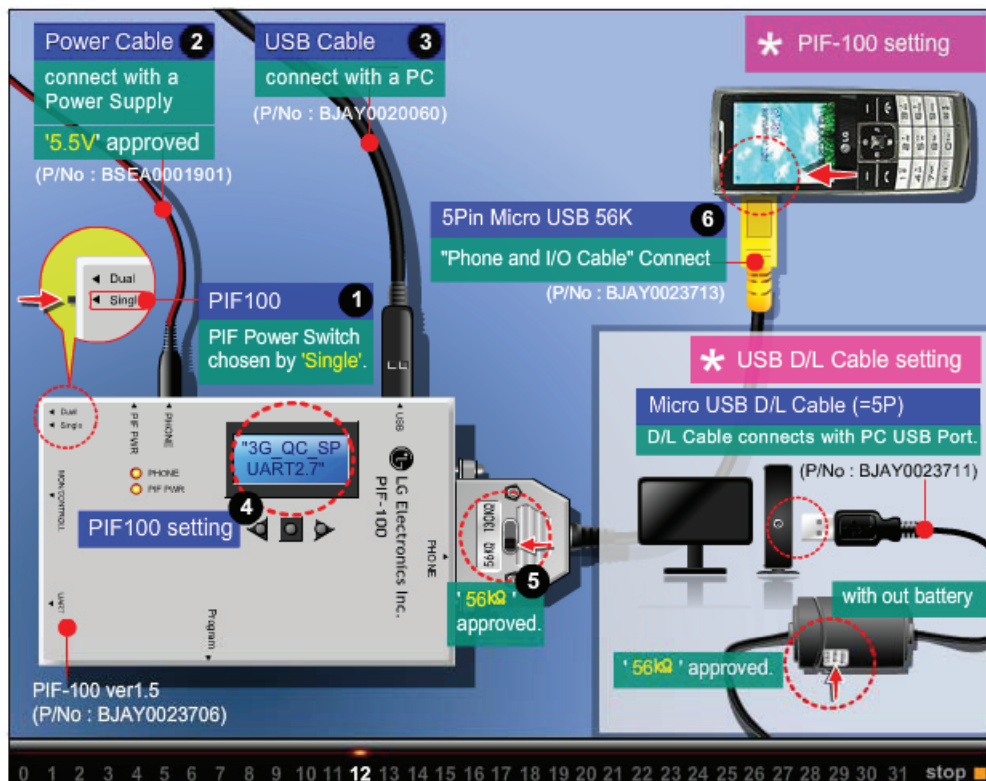
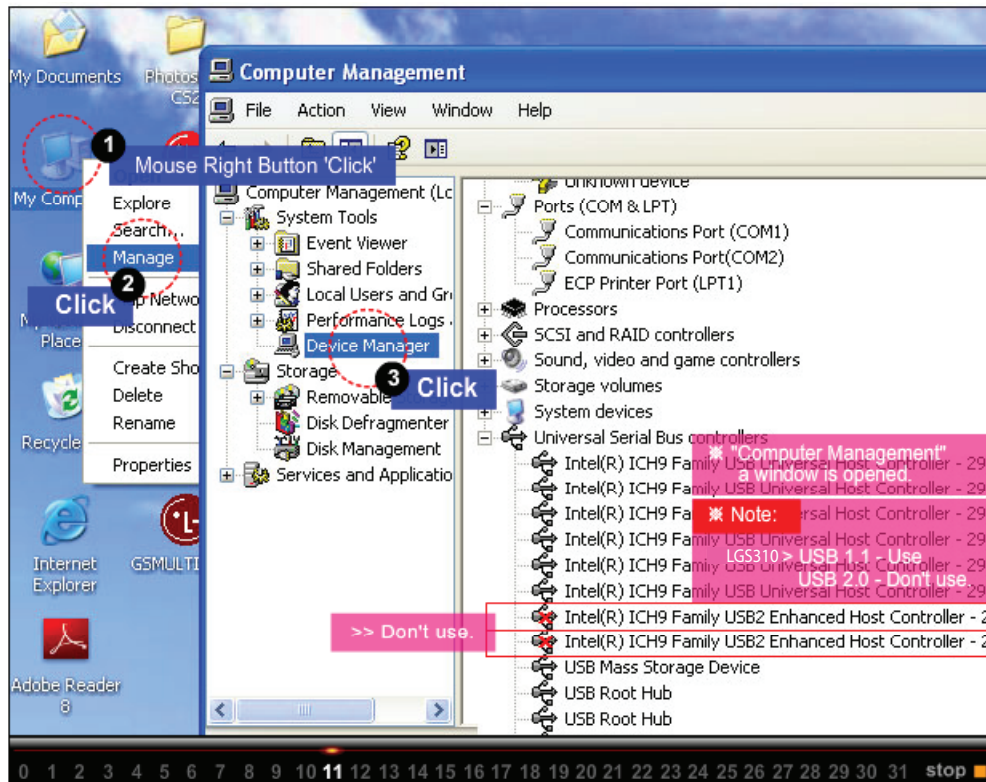
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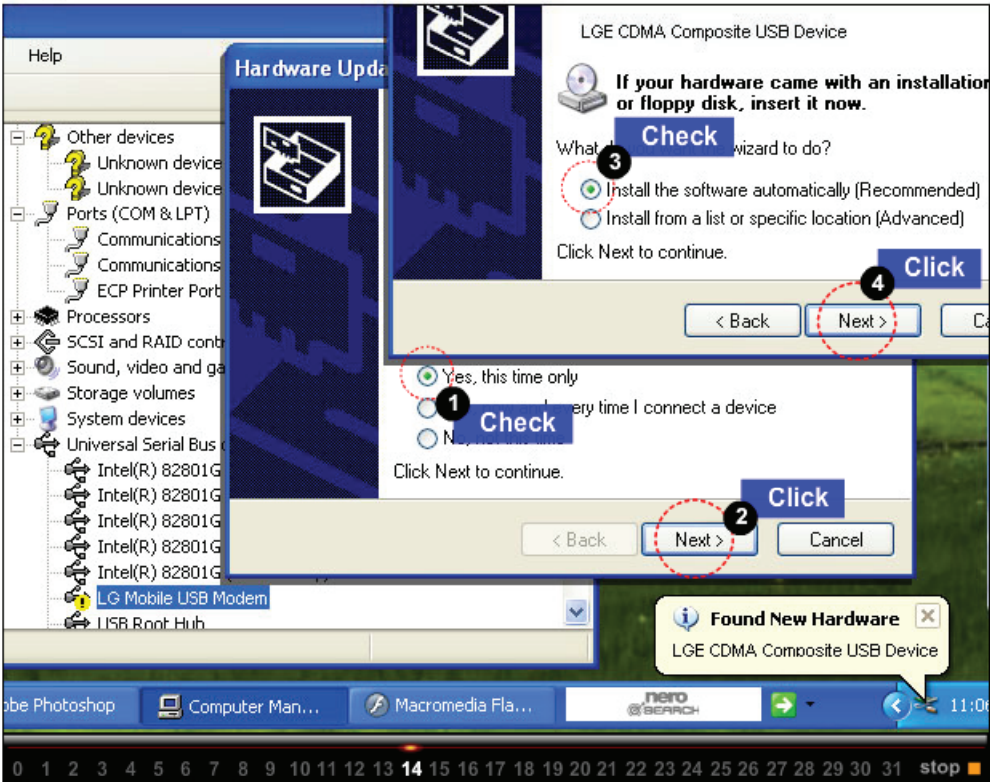
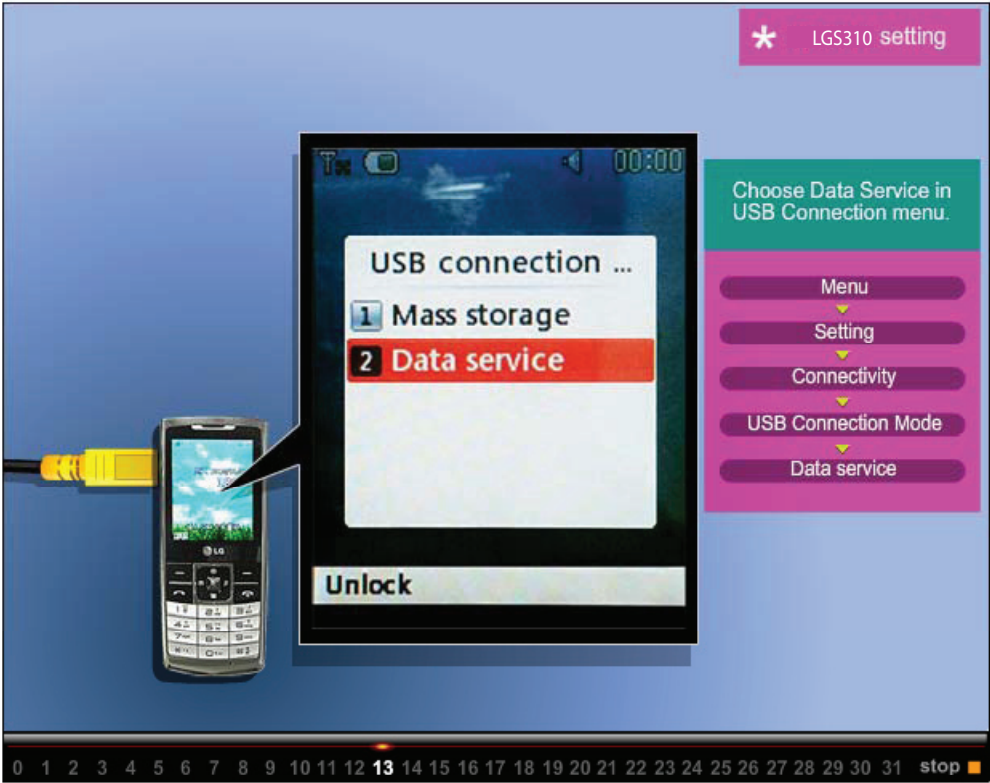


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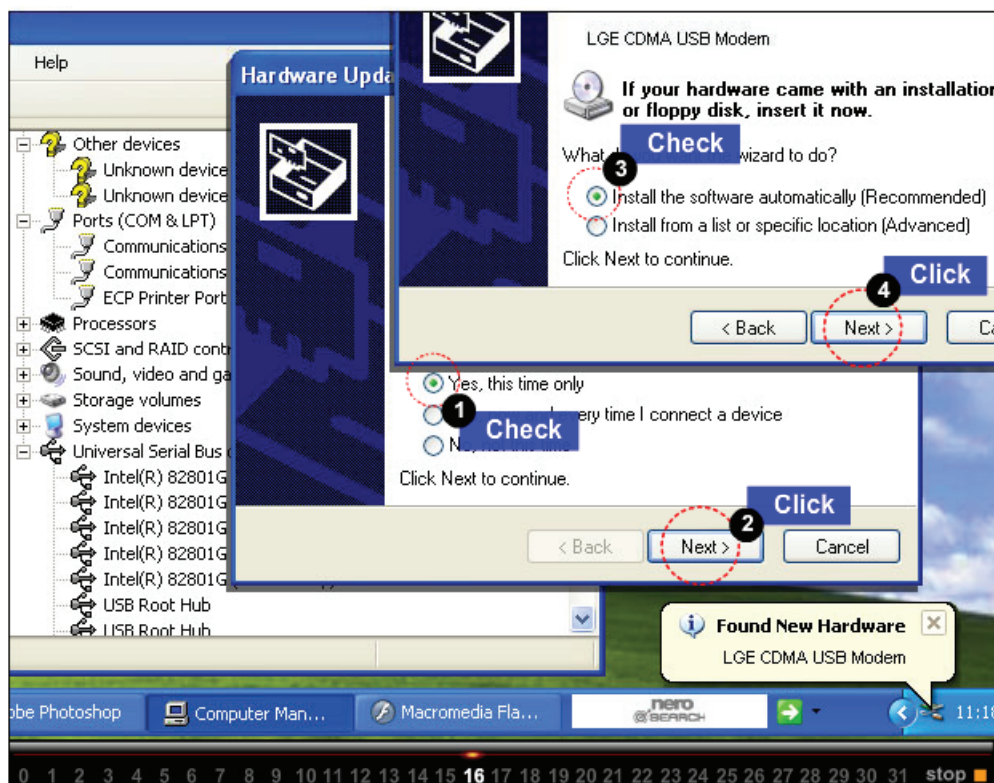
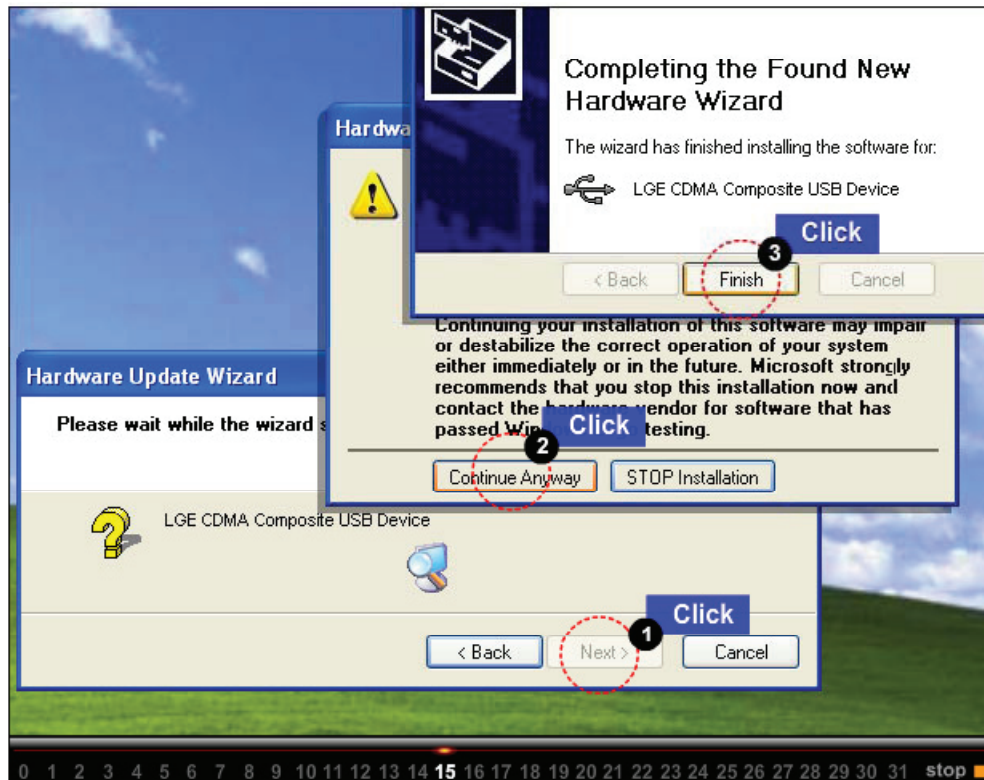


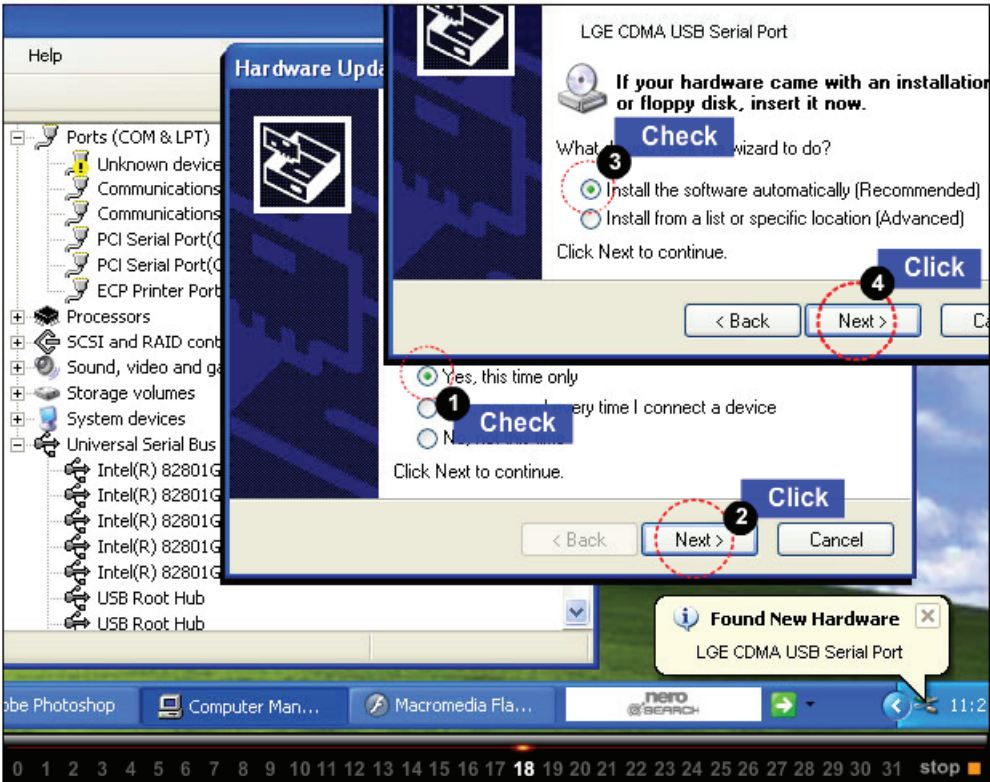
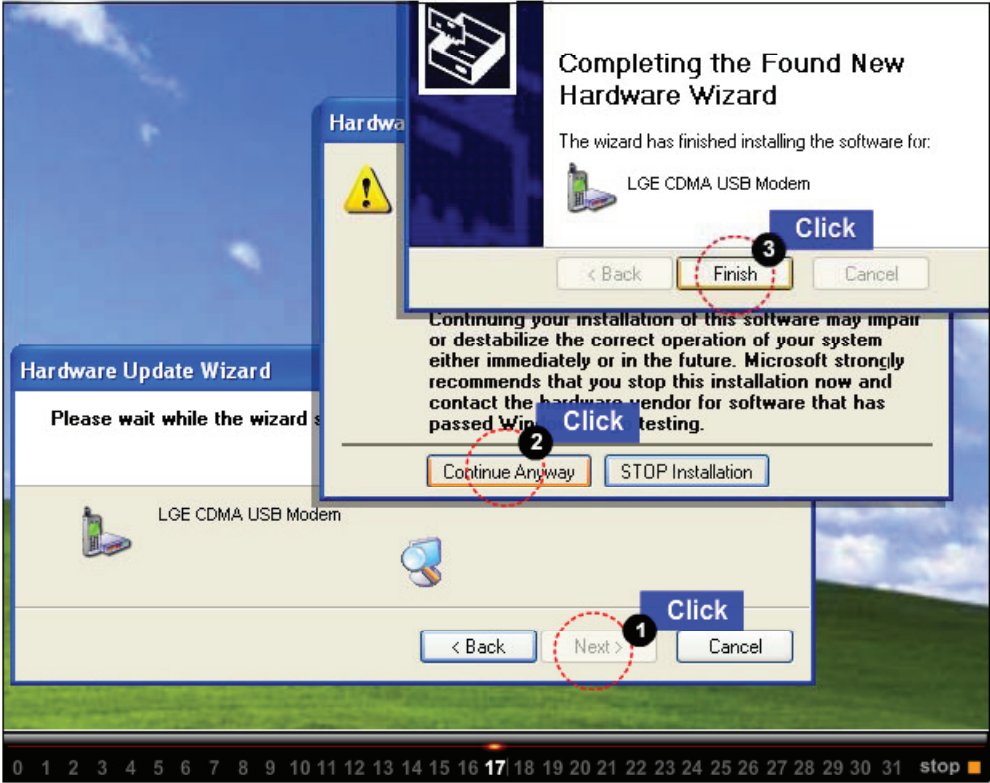
## 5. DOWNLOAD



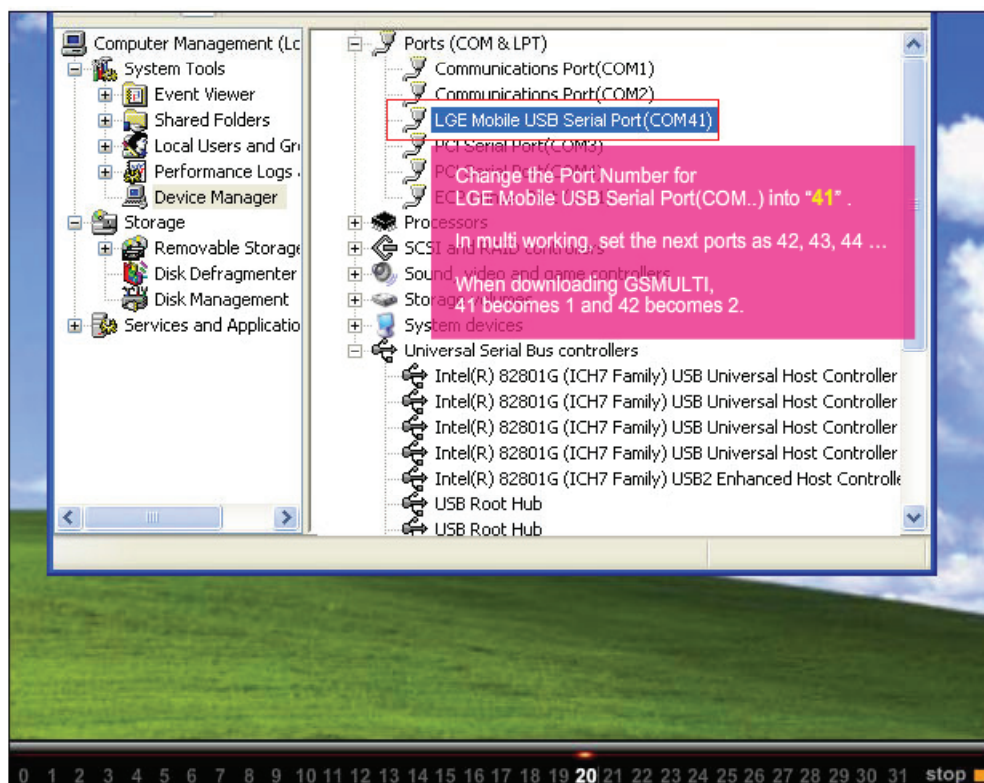
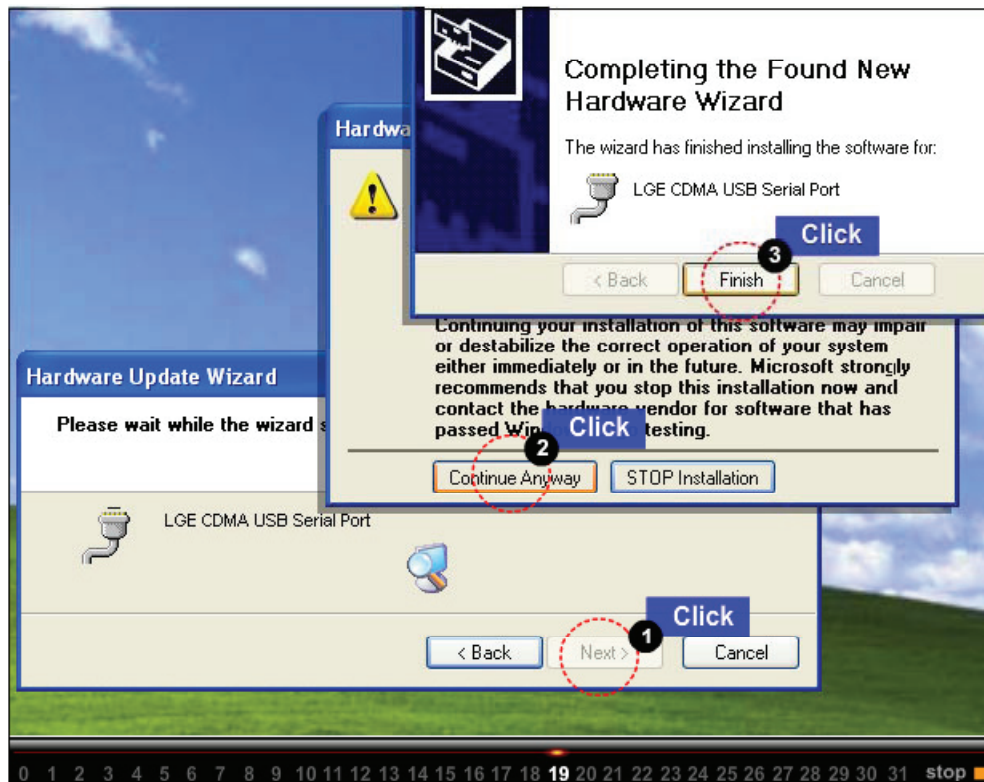


## 5. DOWNLOAD

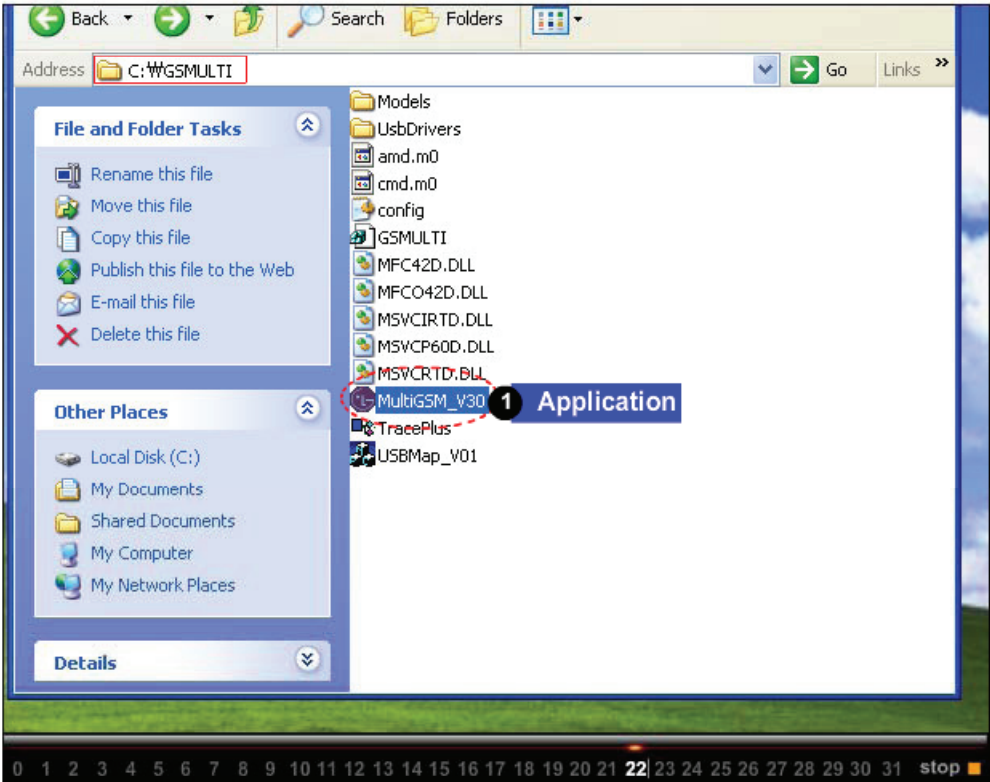




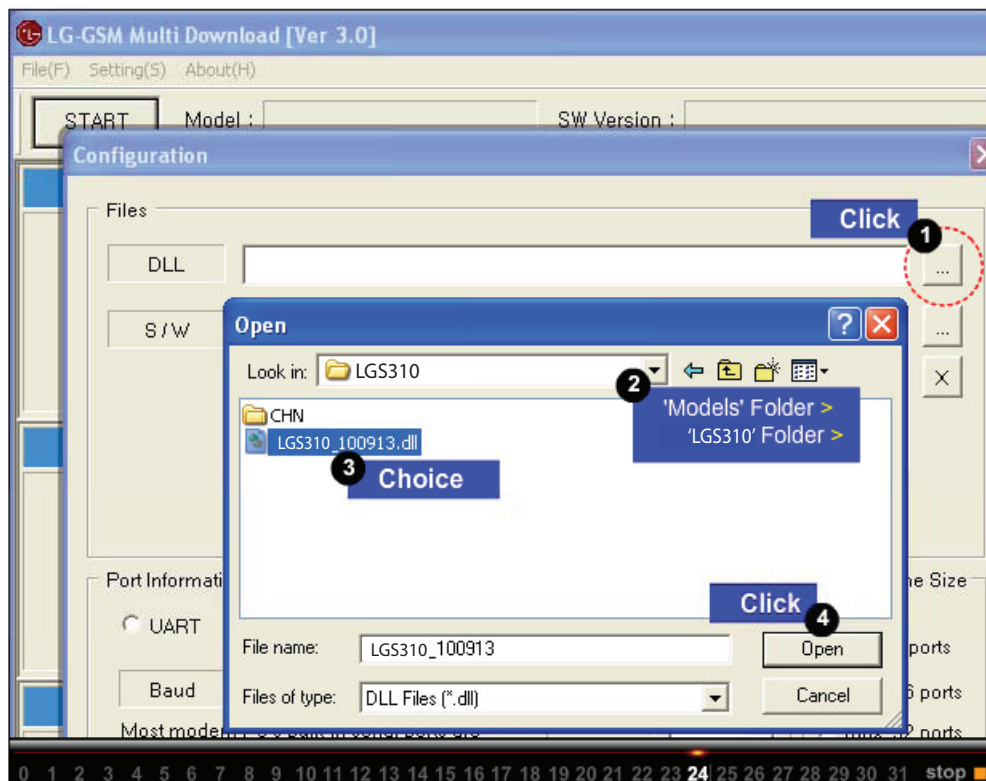
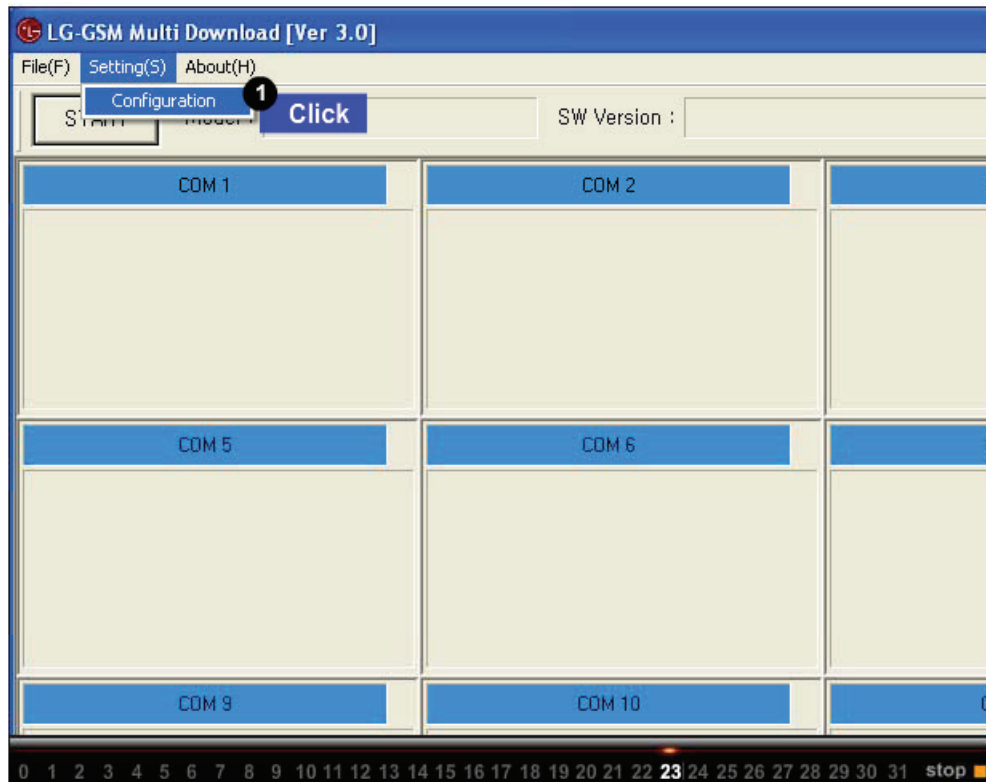
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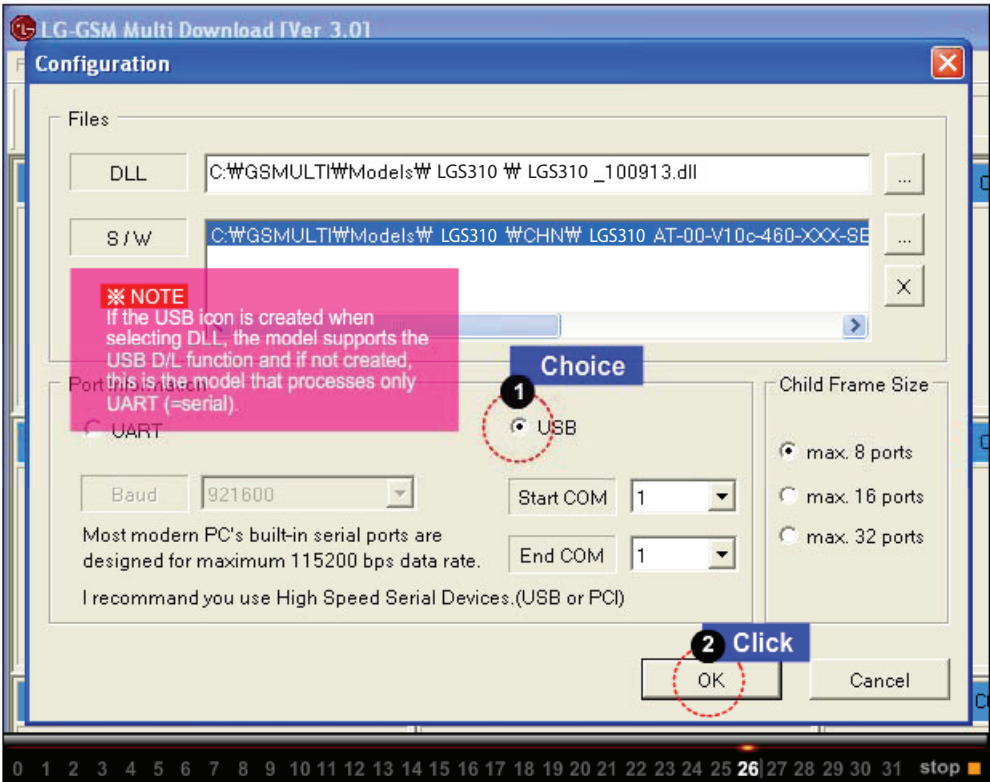
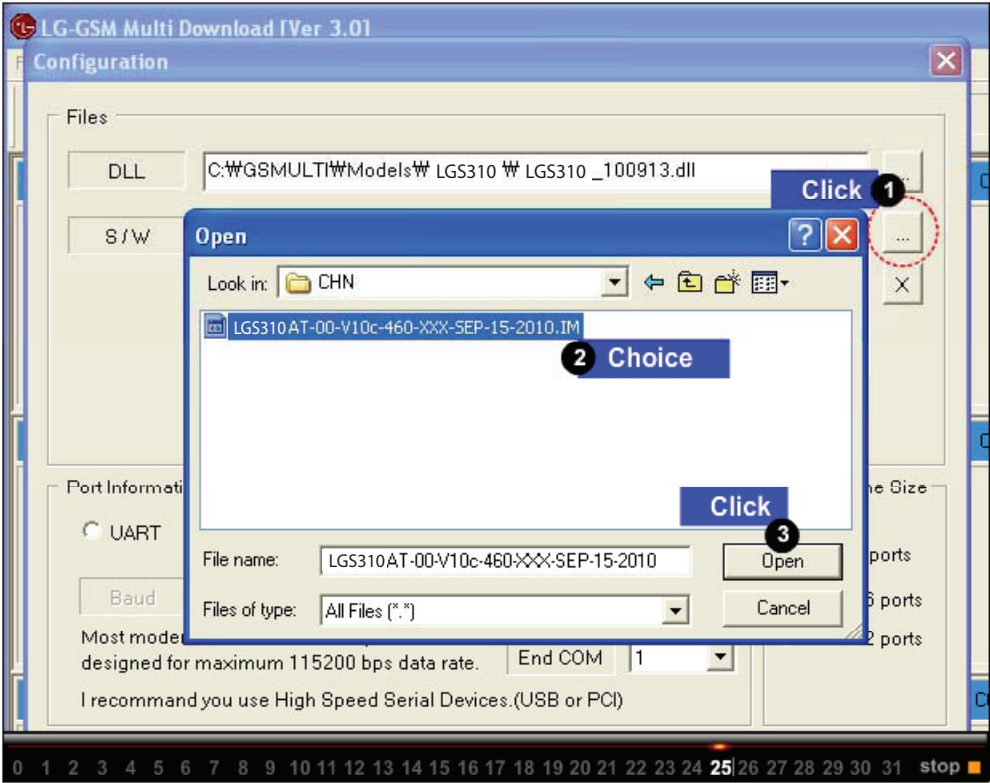
## 5. DOWNLOAD



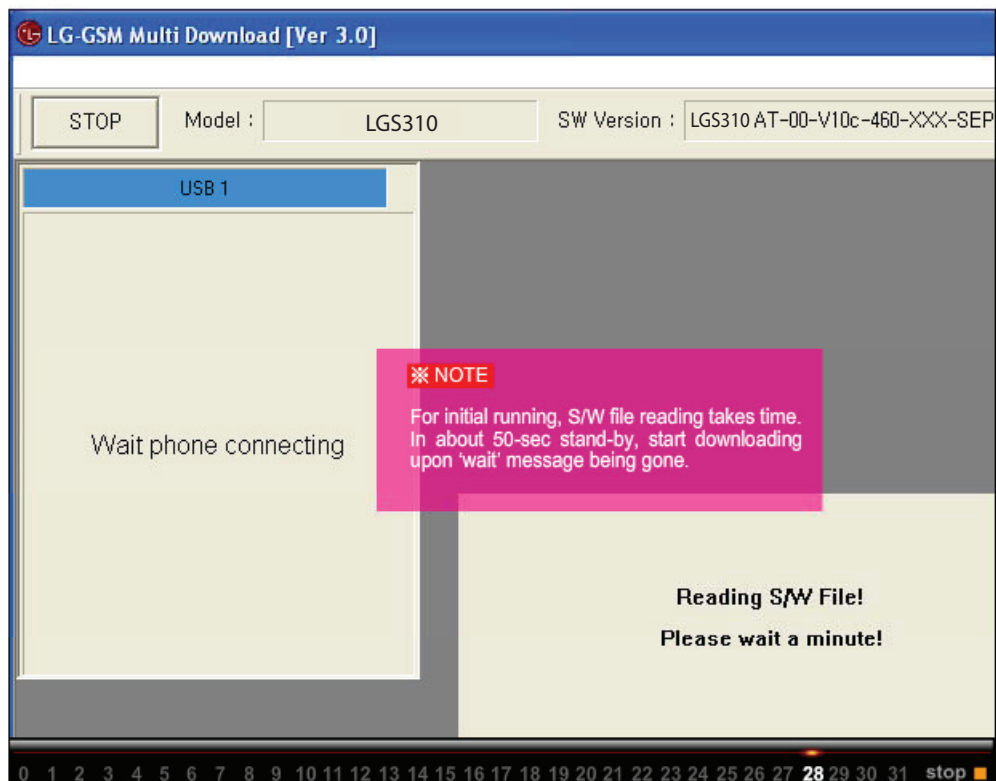
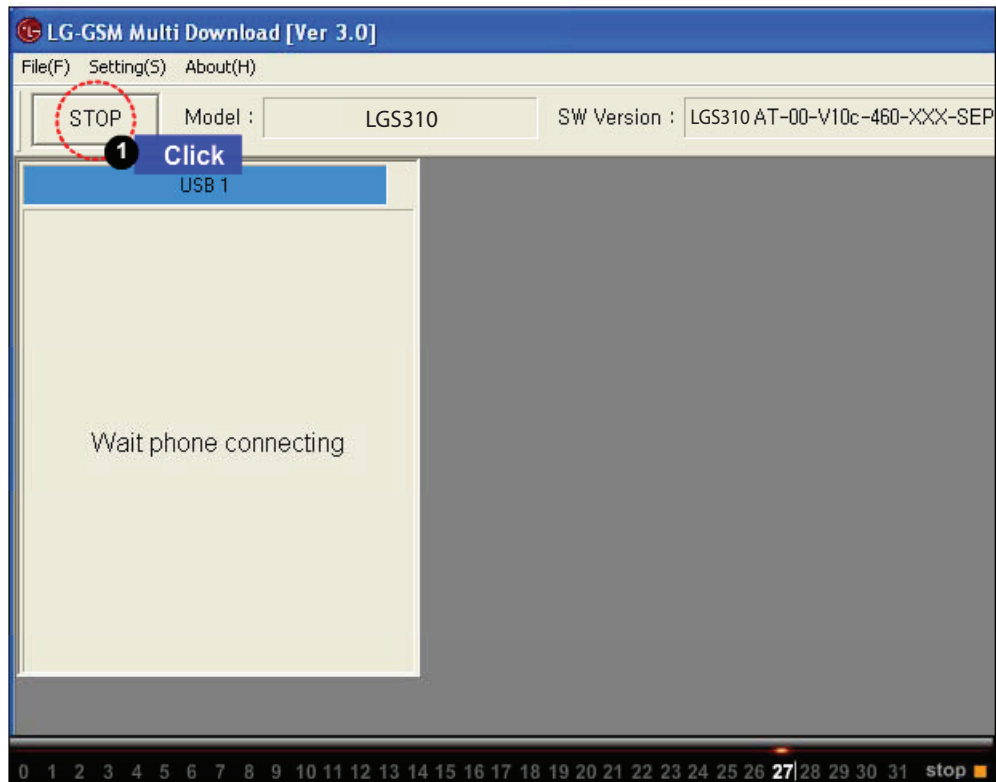
## 5. DOWNLOAD



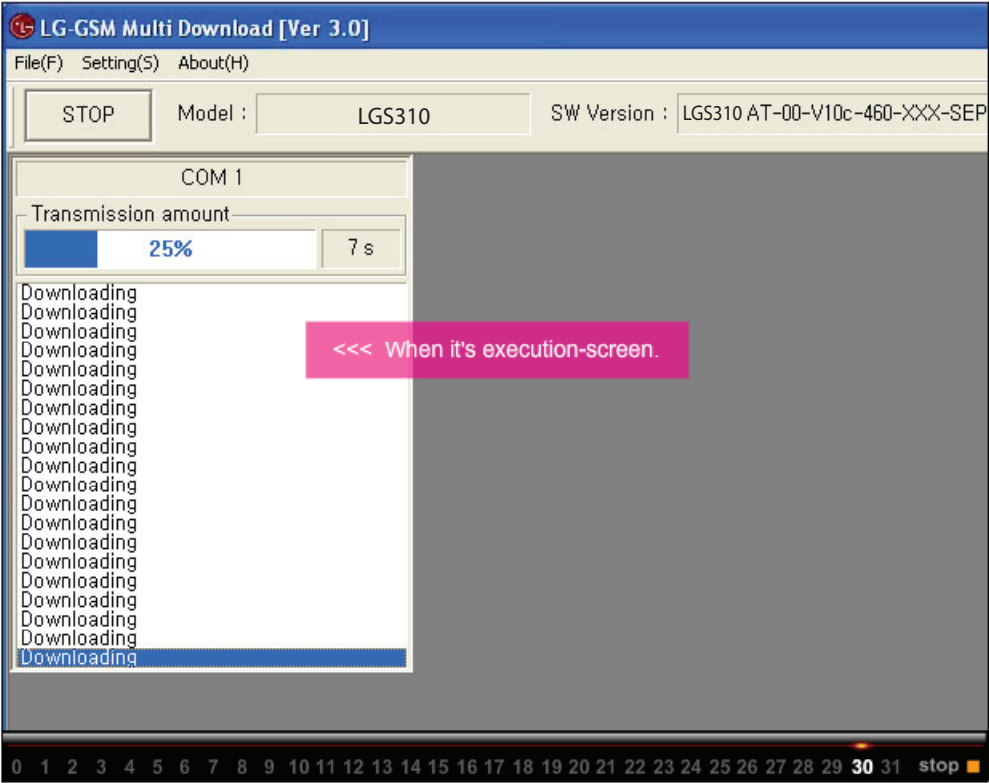
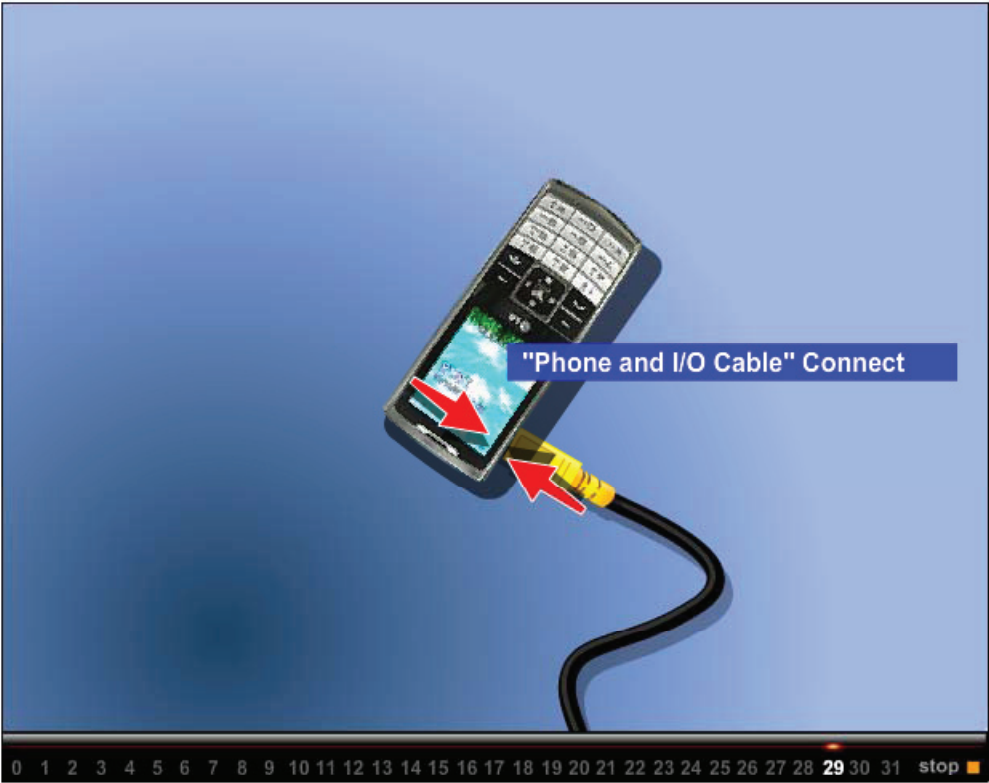
5. DOWNLOAD



## 5. DOWNLOAD

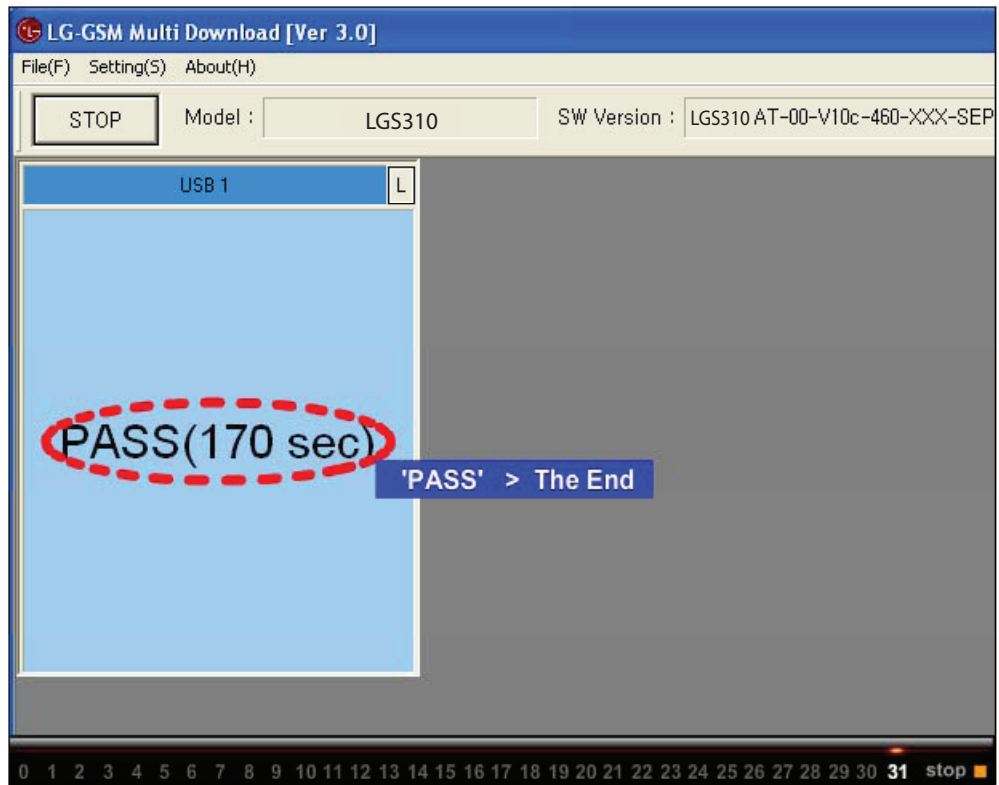


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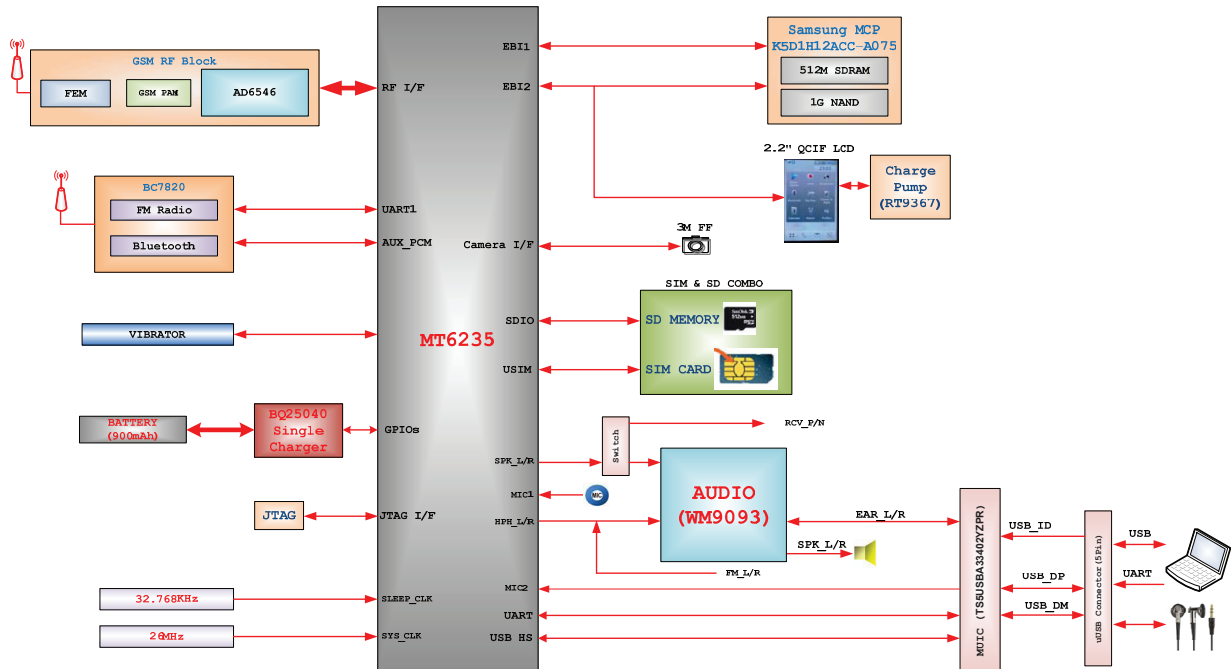


## 5. DOWNLOAD

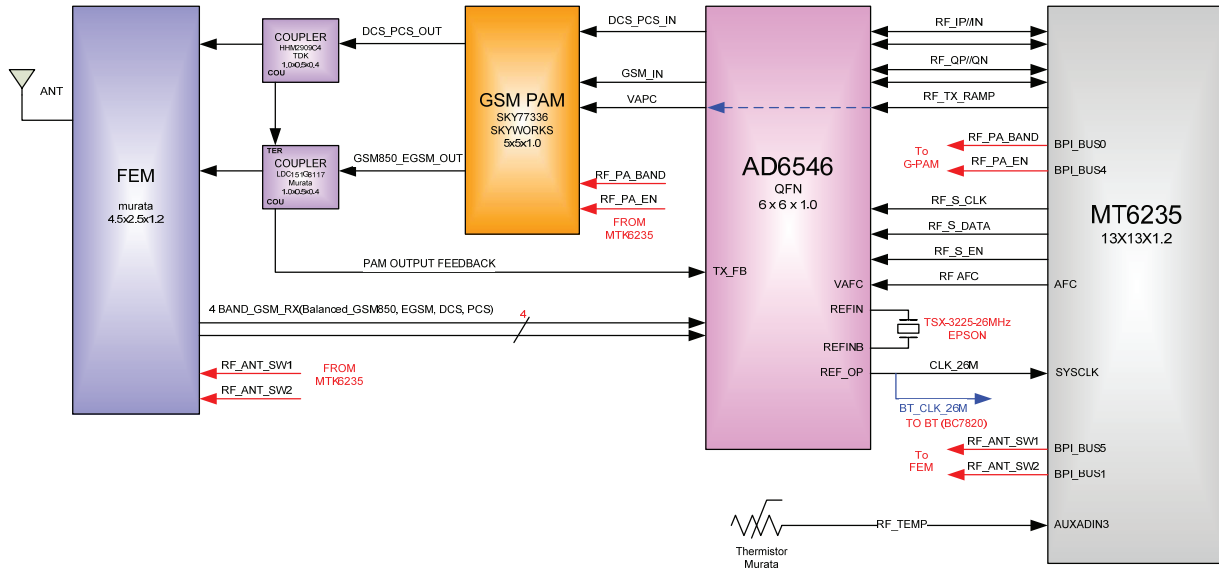
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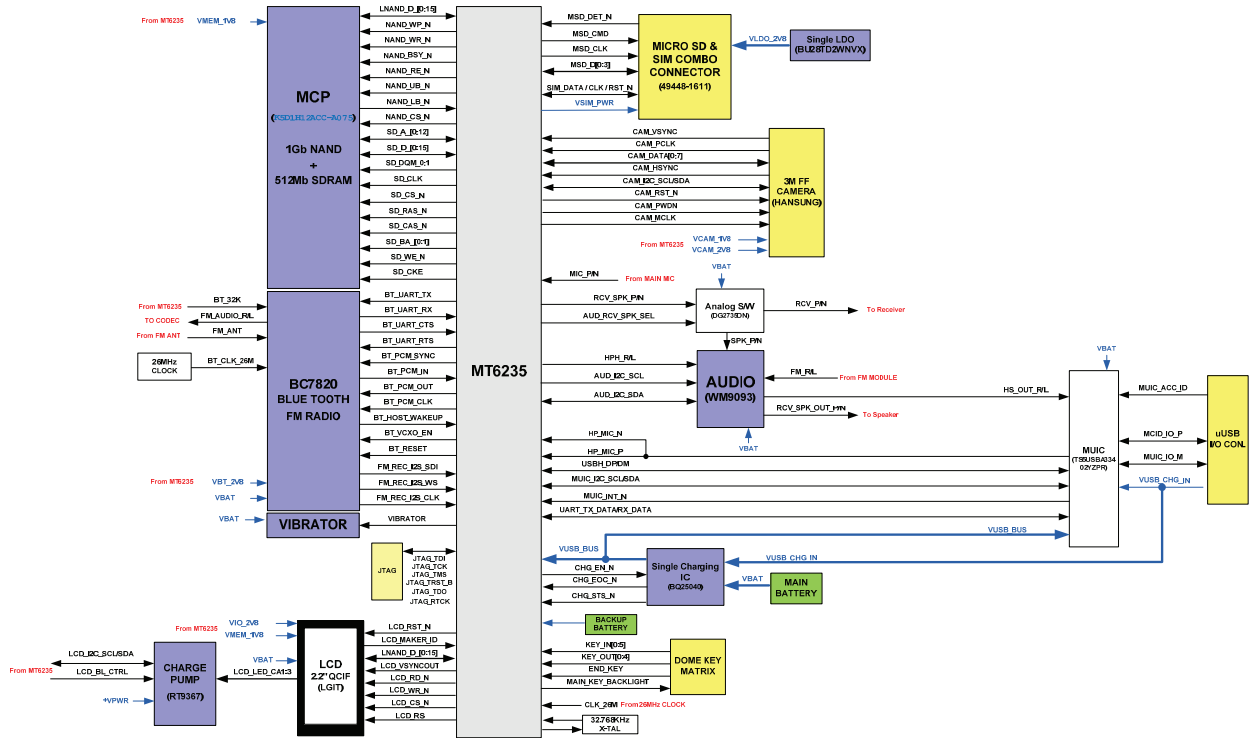
## 6. BLOCK DIAGRAM



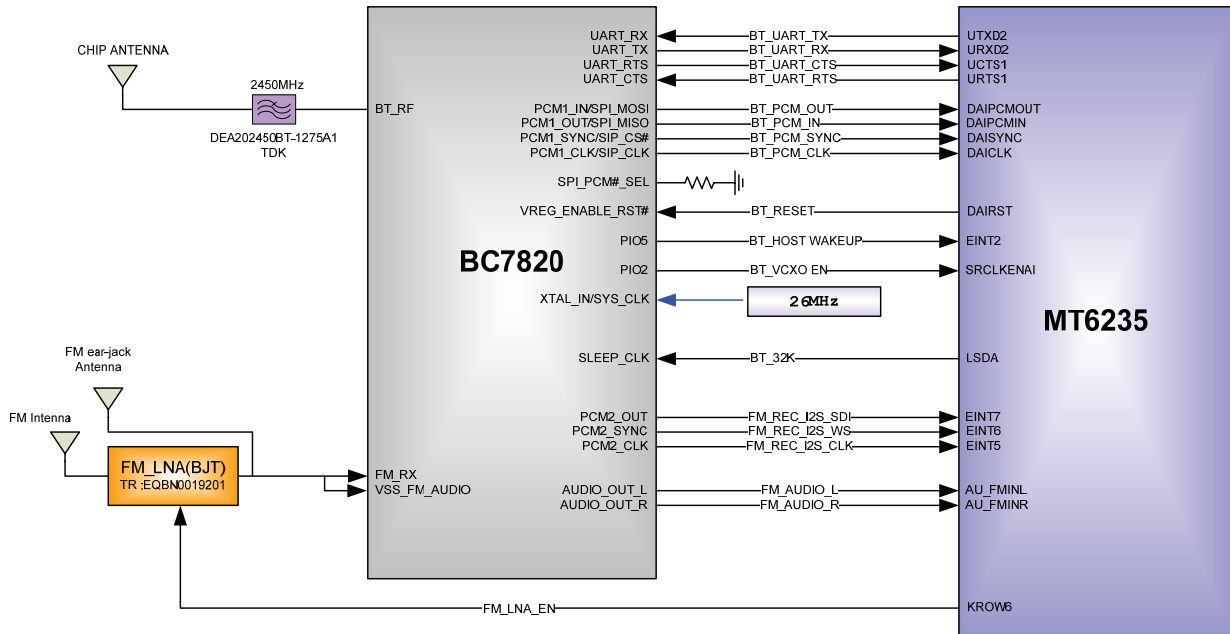
## 6. BLOCK DIAGRAM



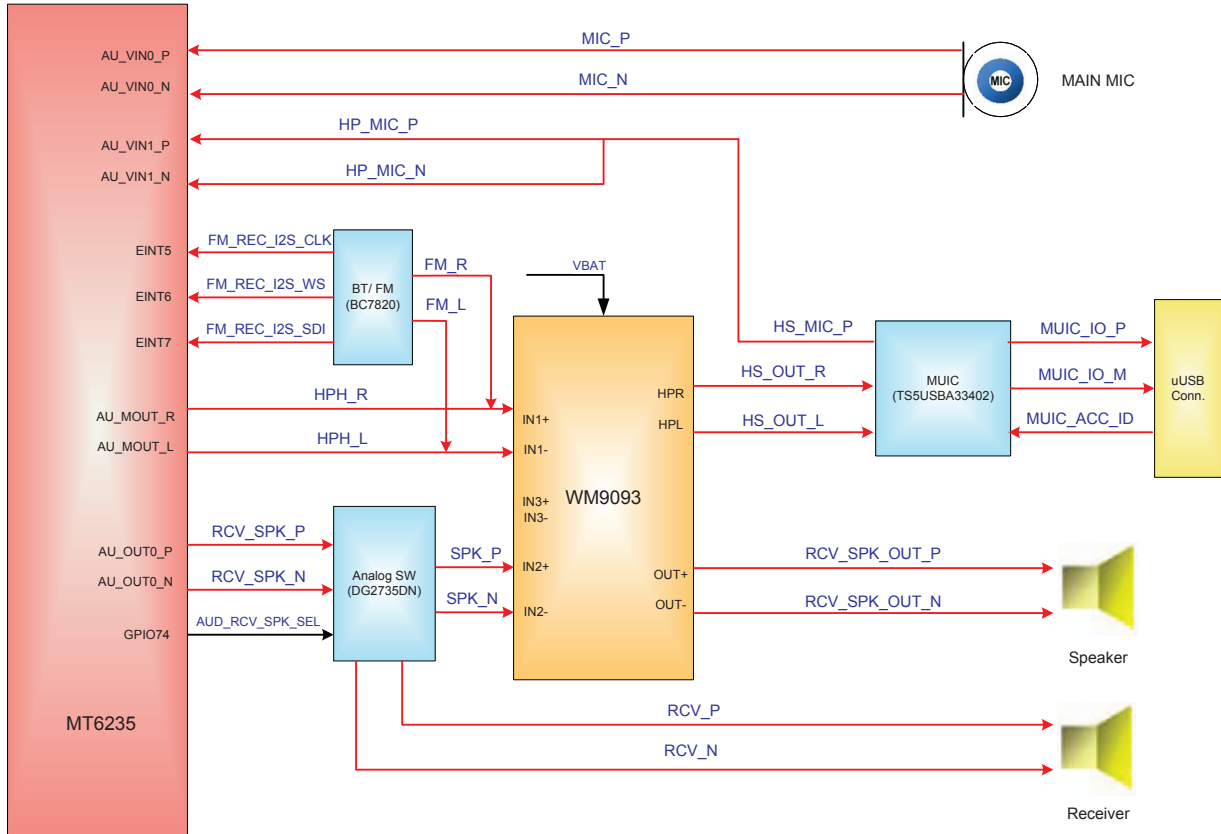
## 6. BLOCK DIAGRAM



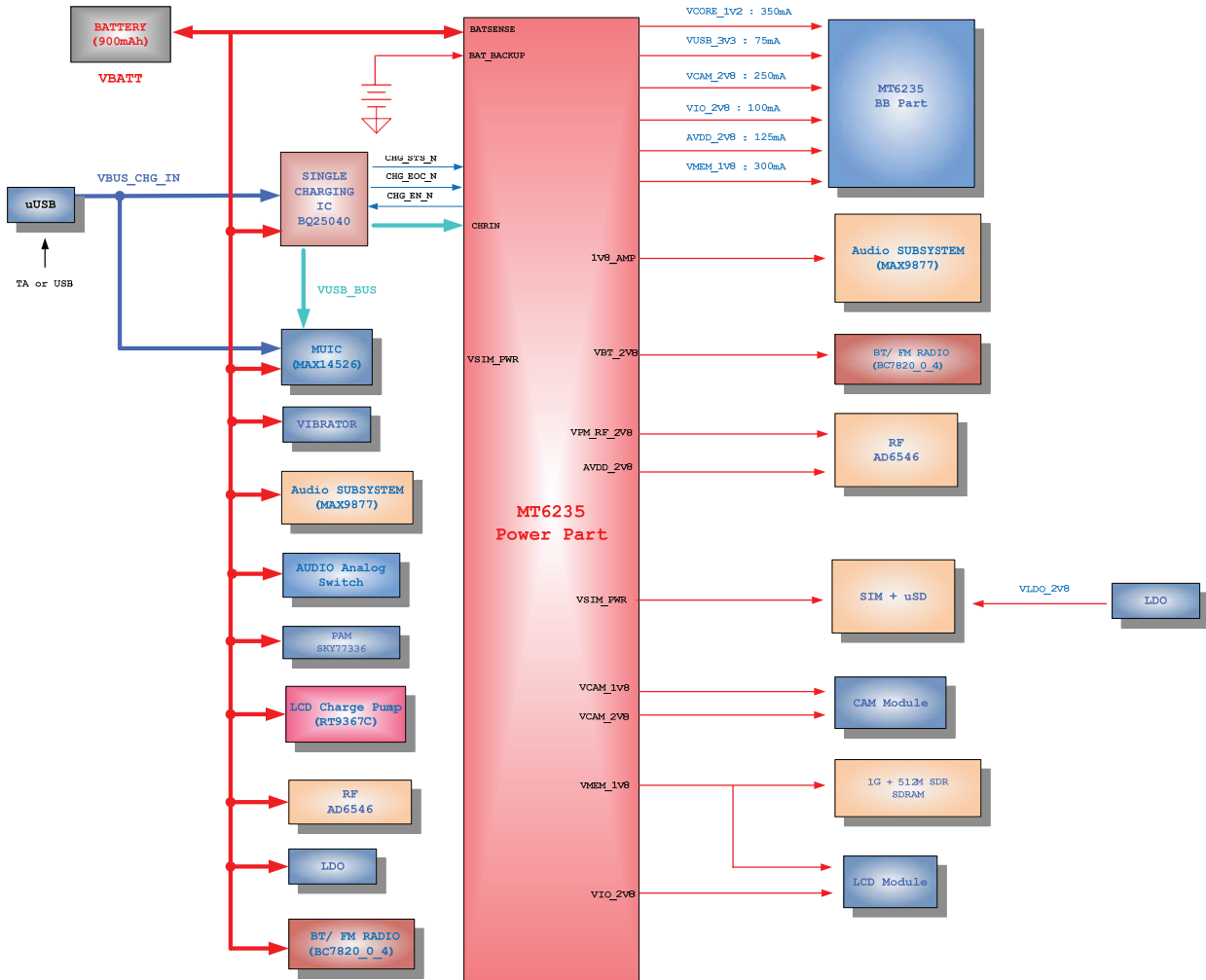
## 6. BLOCK DIAGRAM



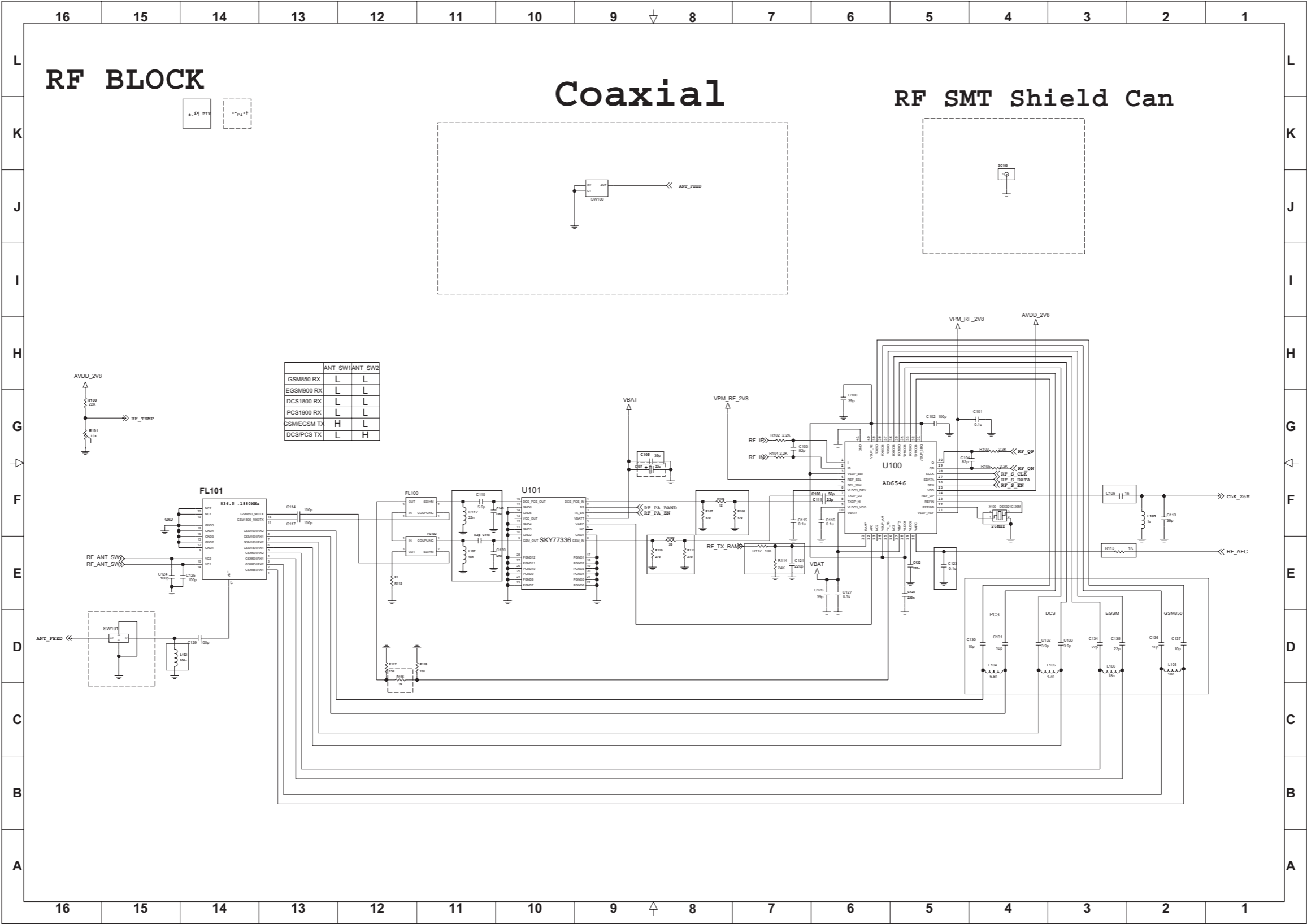
## 6. BLOCK DIAGRAM



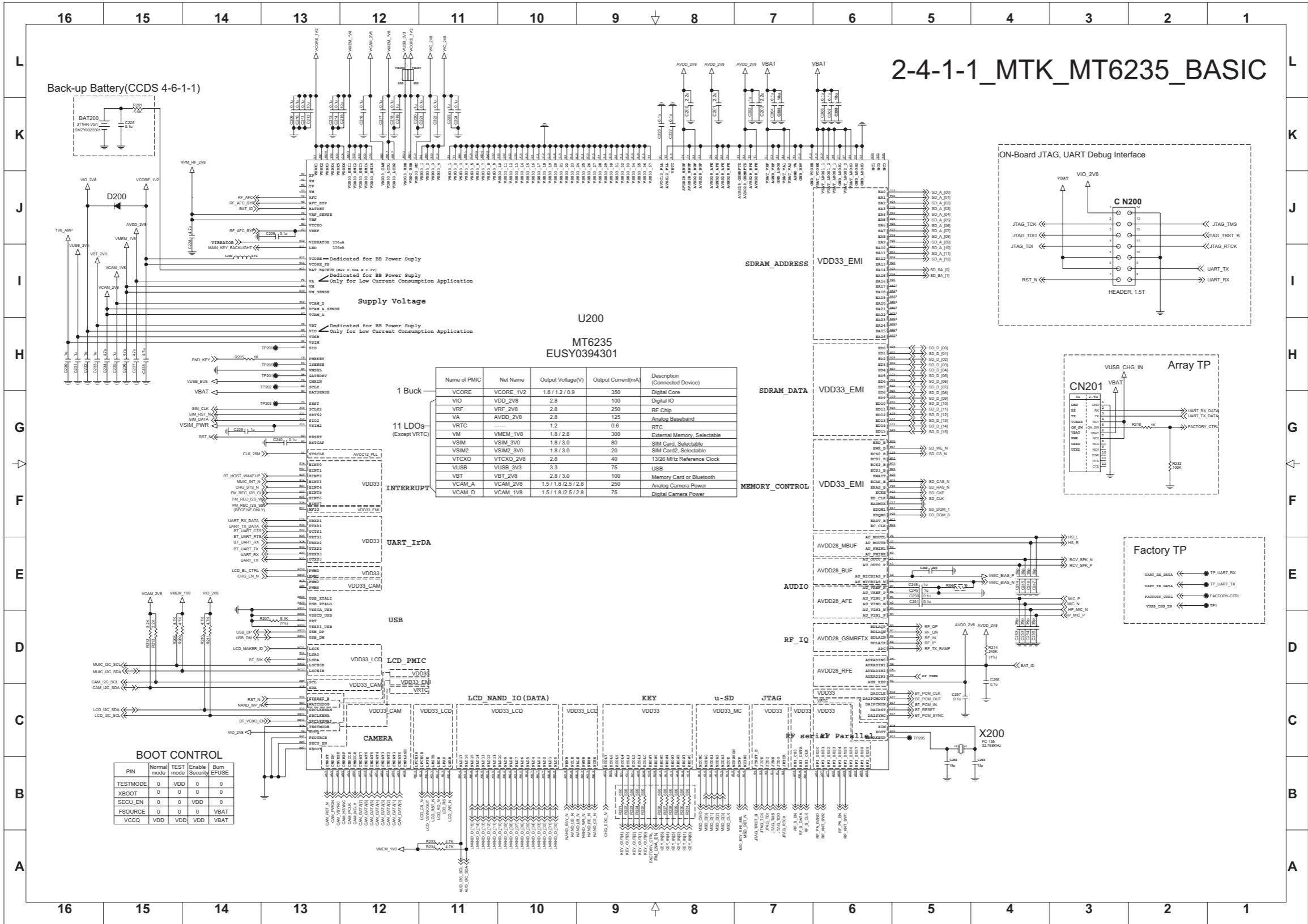
## 6. BLOCK DIAGRAM



7. CIRCUIT DIAGRAM



# 7. CIRCUIT DIAGRAM

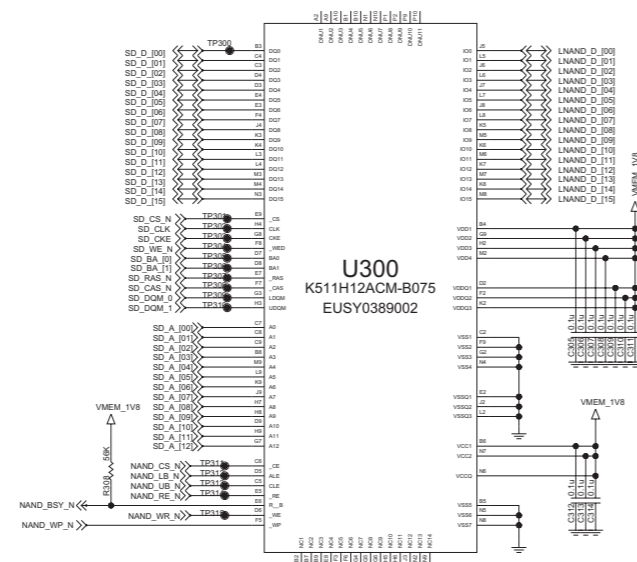


## 7. CIRCUIT DIAGRAM



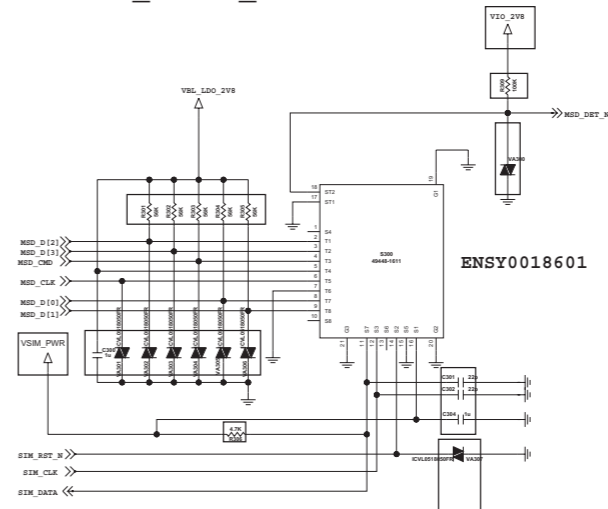
Because 1G+512 SDR MCP don't configure in CCDS, we follow RIPTION model.

(SS, 1Gbit\_LBX16\_ NAND + 512Mbit SDR SDRAM)

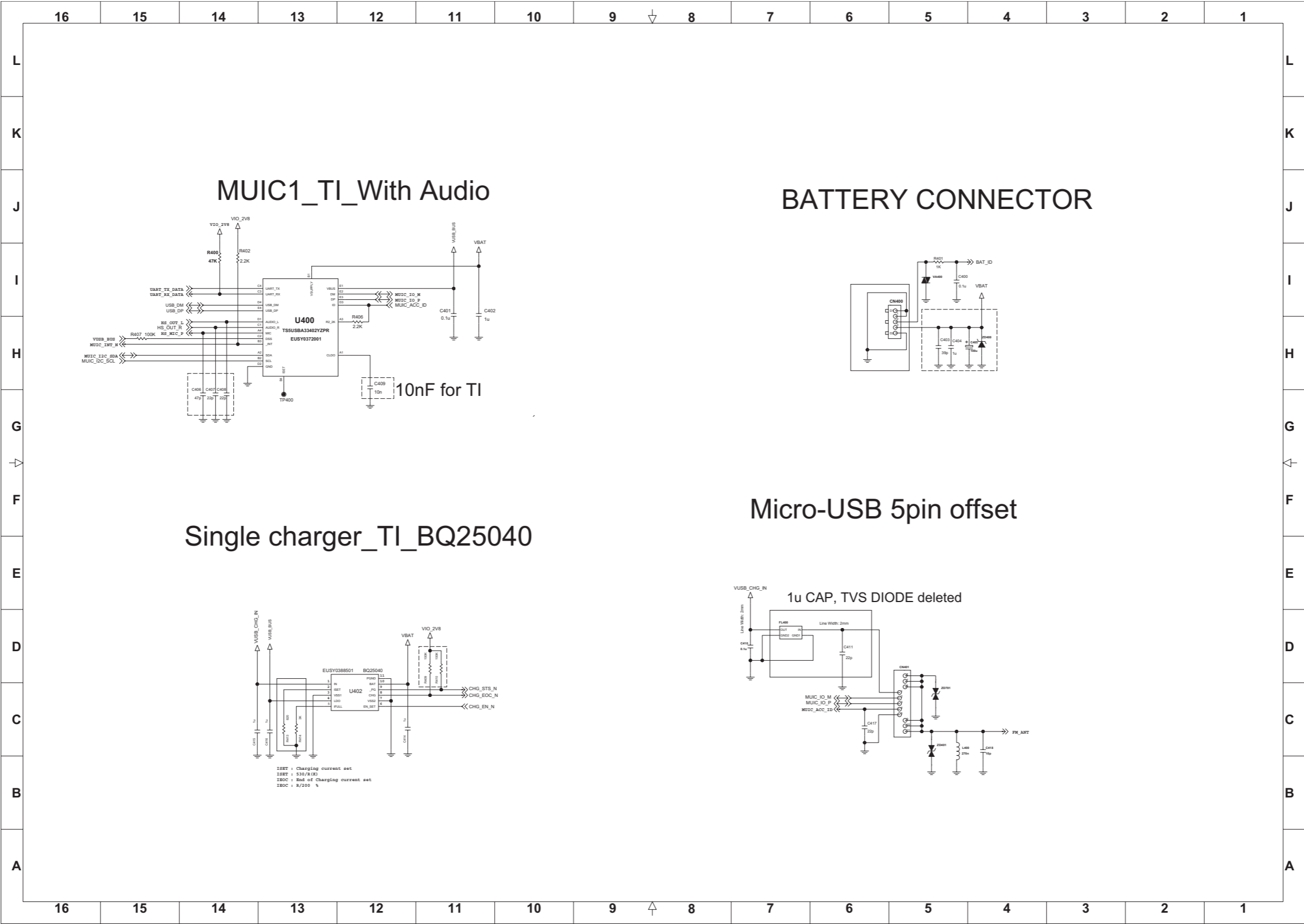


## Combo Type

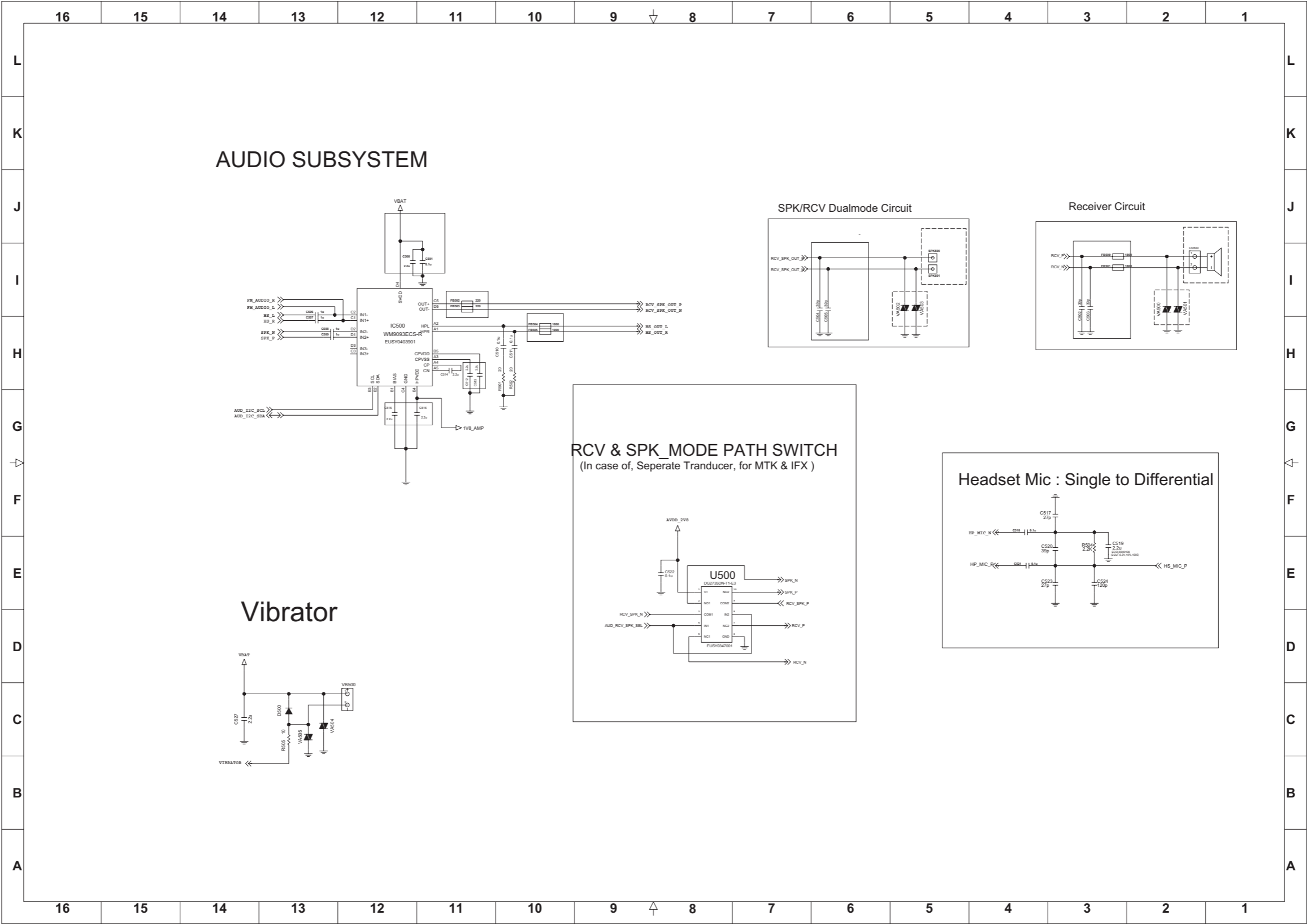
### 3-2-3-1 Combo Left



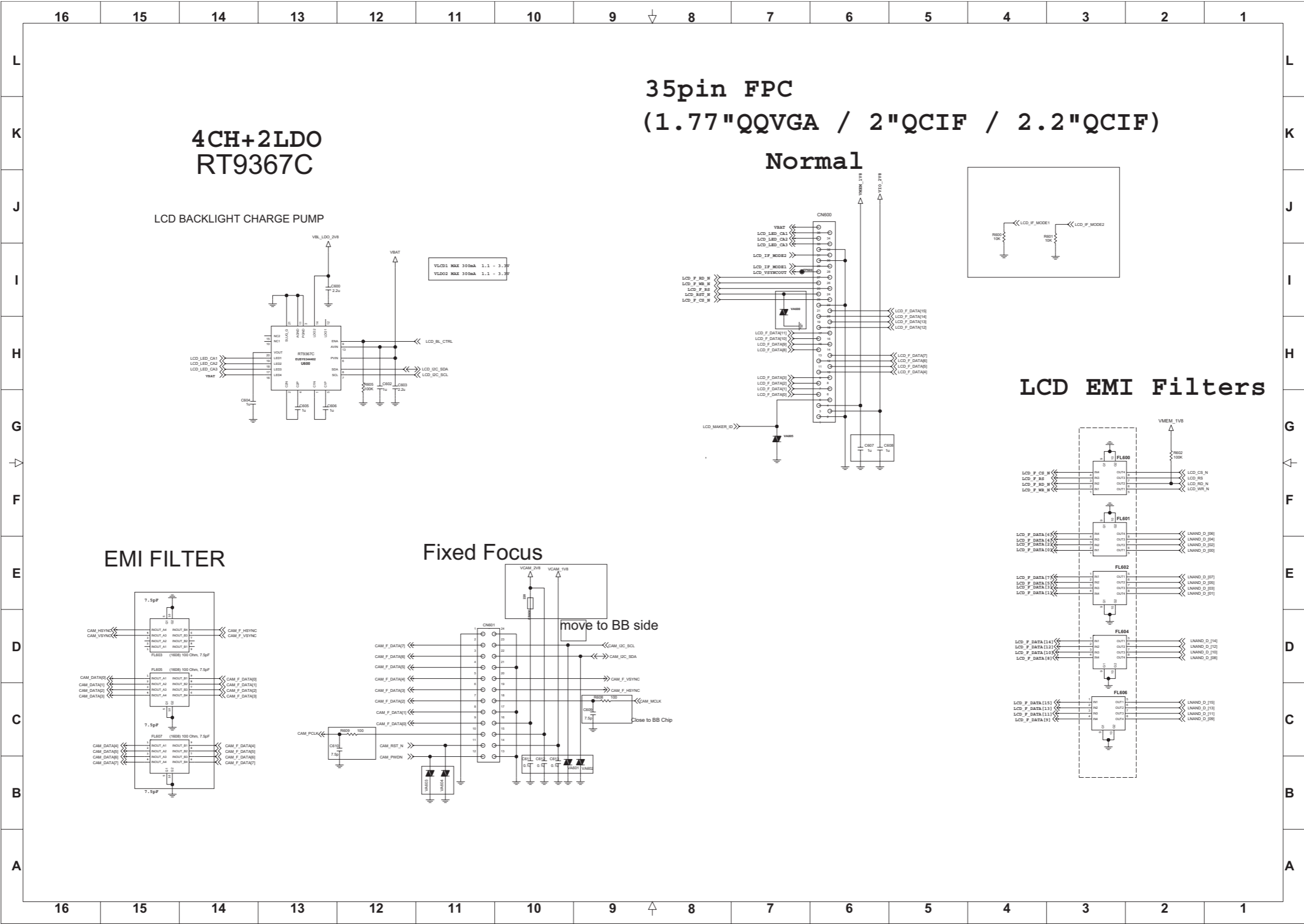
7. CIRCUIT DIAGRAM



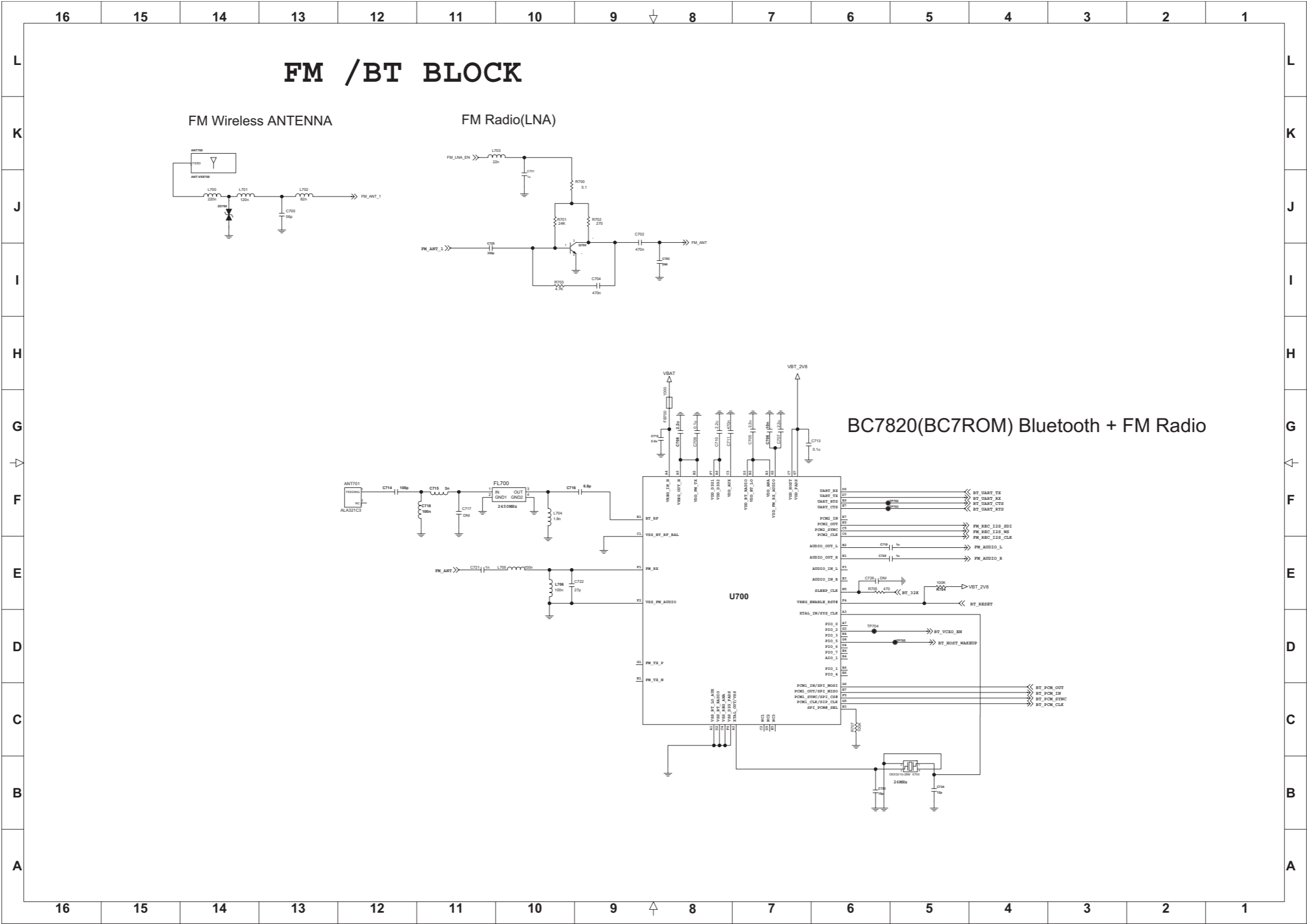
7. CIRCUIT DIAGRAM



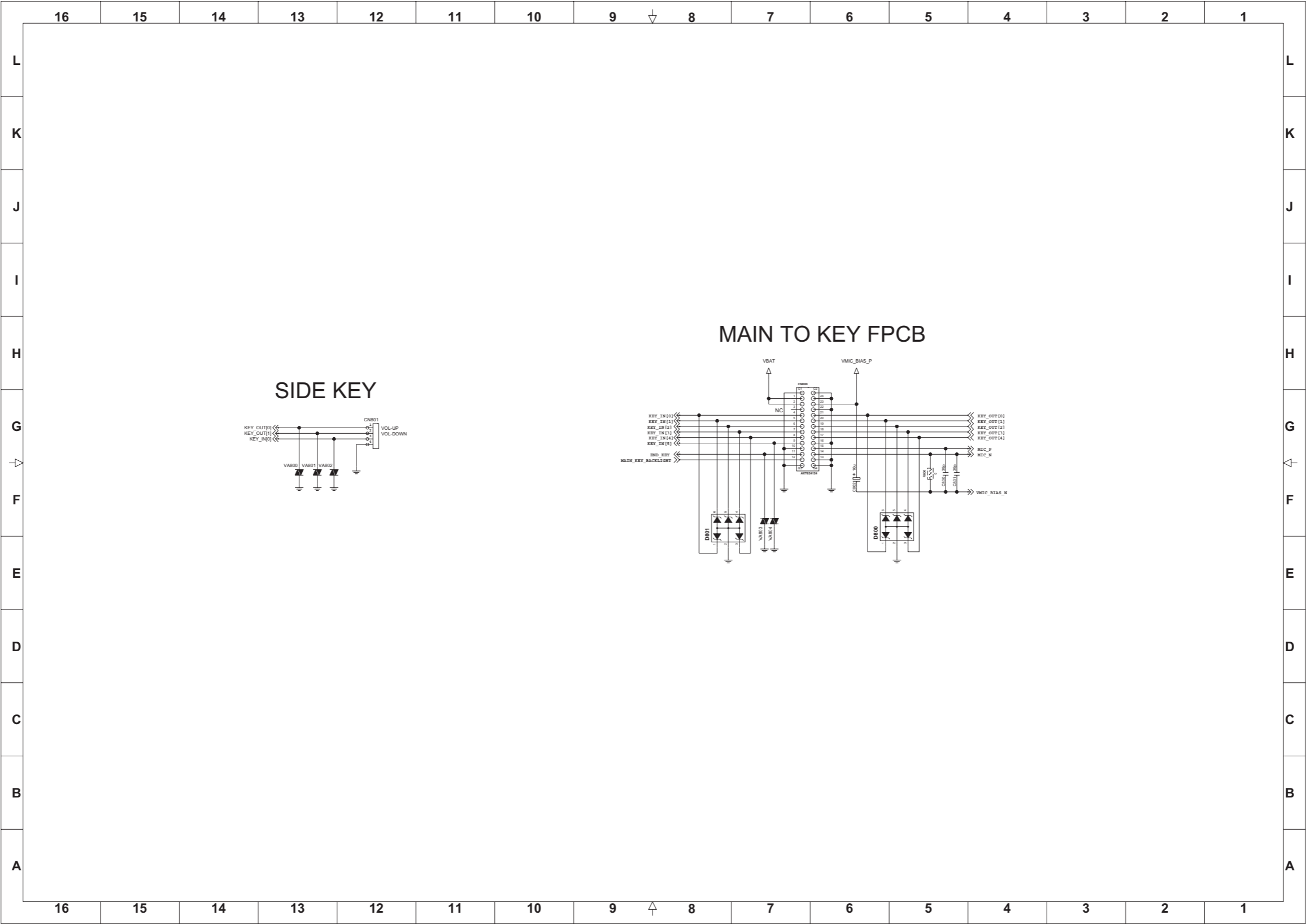
7. CIRCUIT DIAGRAM



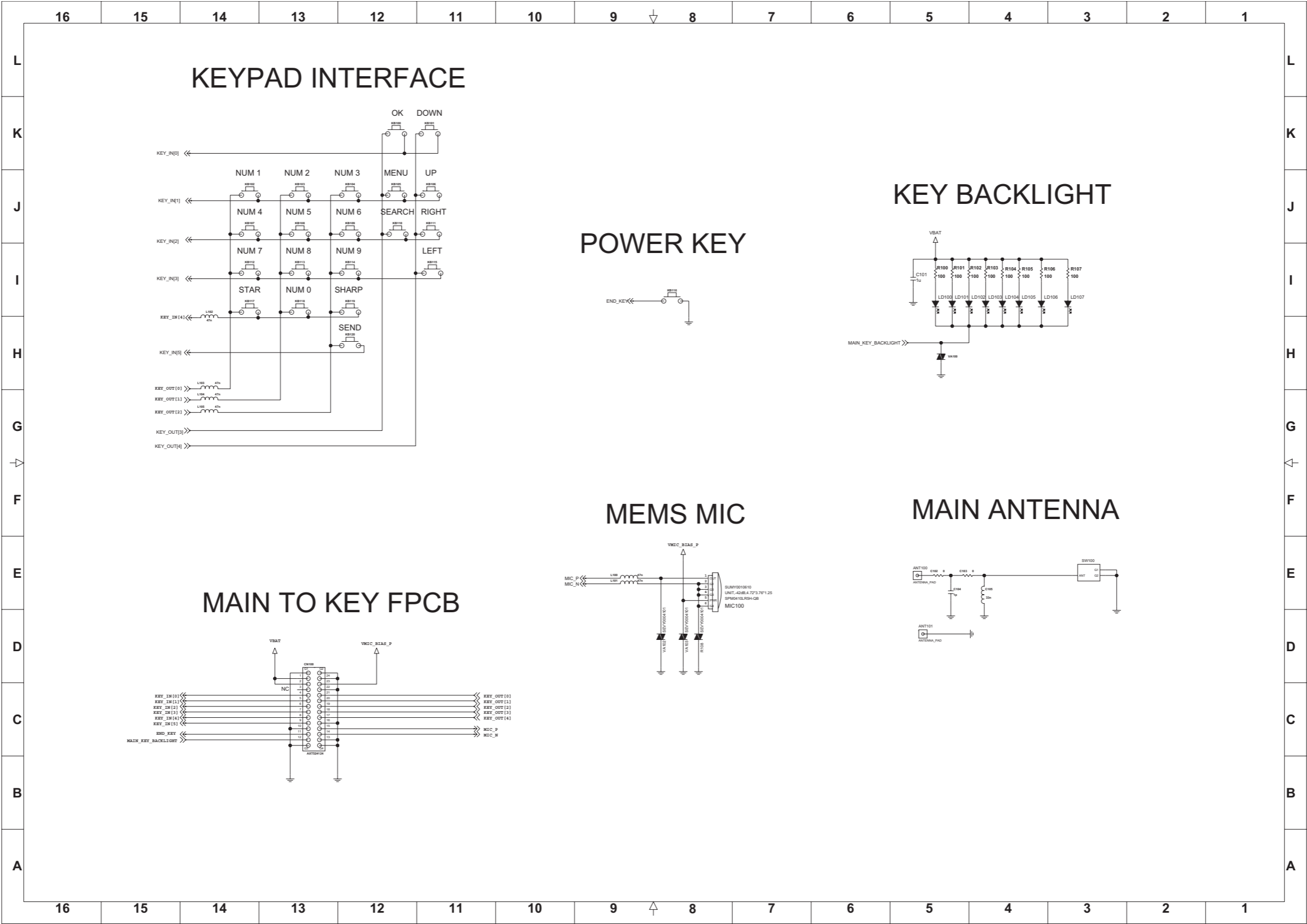
7. CIRCUIT DIAGRAM



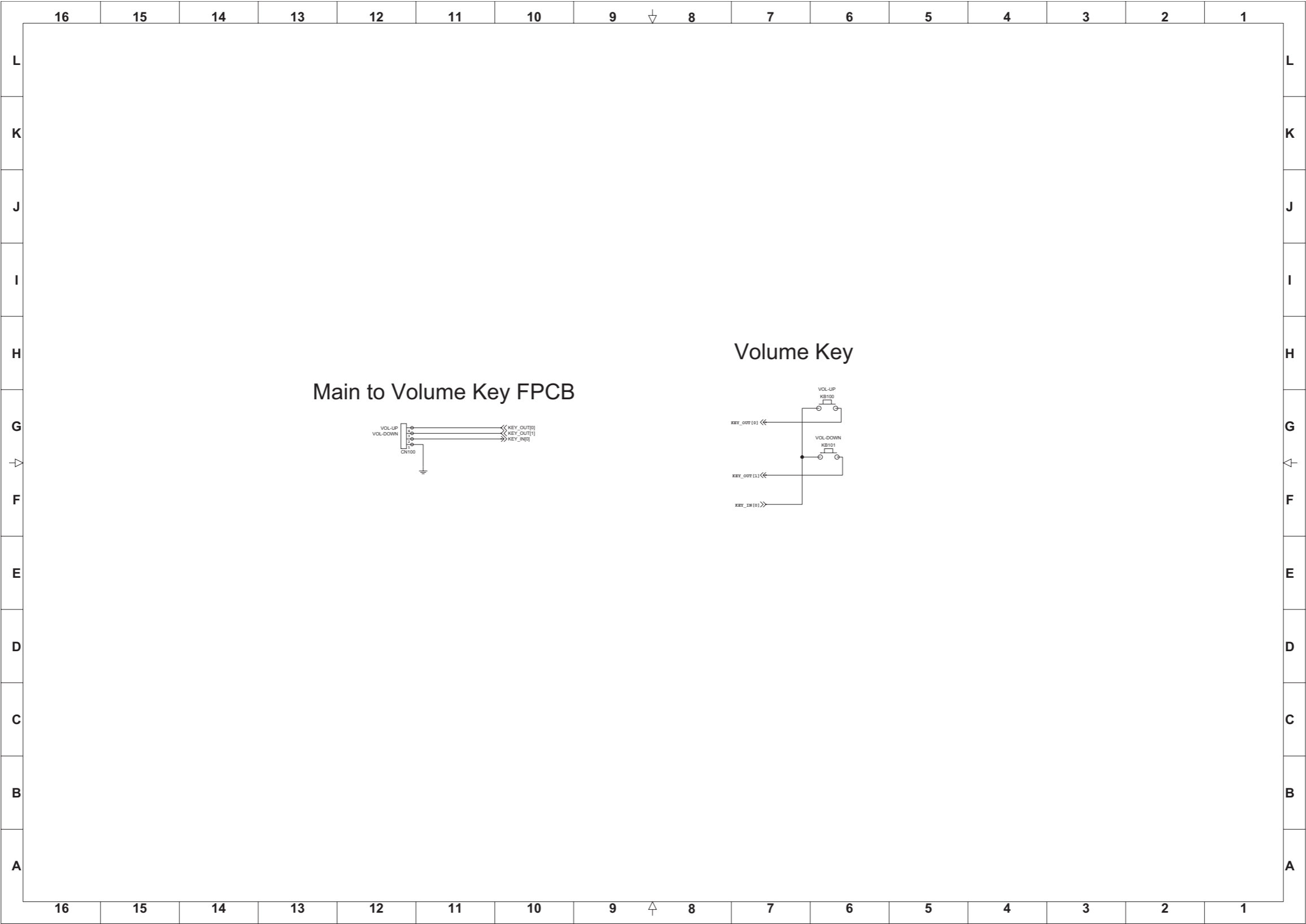
7. CIRCUIT DIAGRAM



7. CIRCUIT DIAGRAM

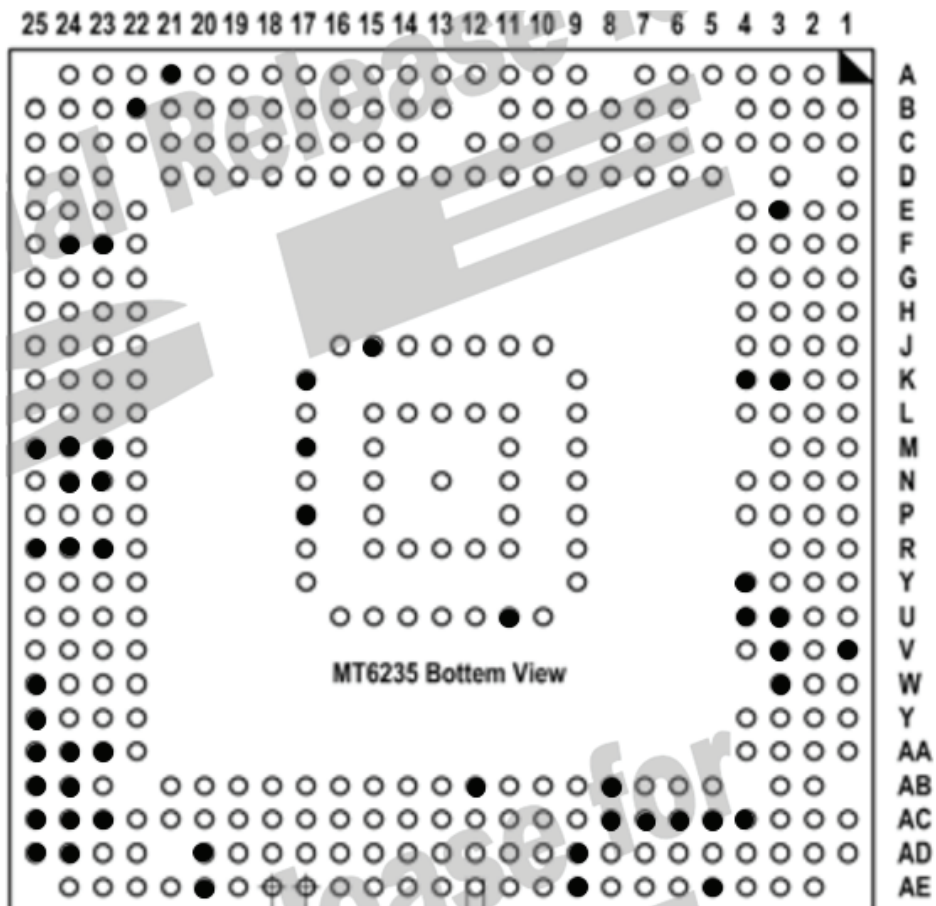


7. CIRCUIT DIAGRAM



## 8. BGA PIN MAP

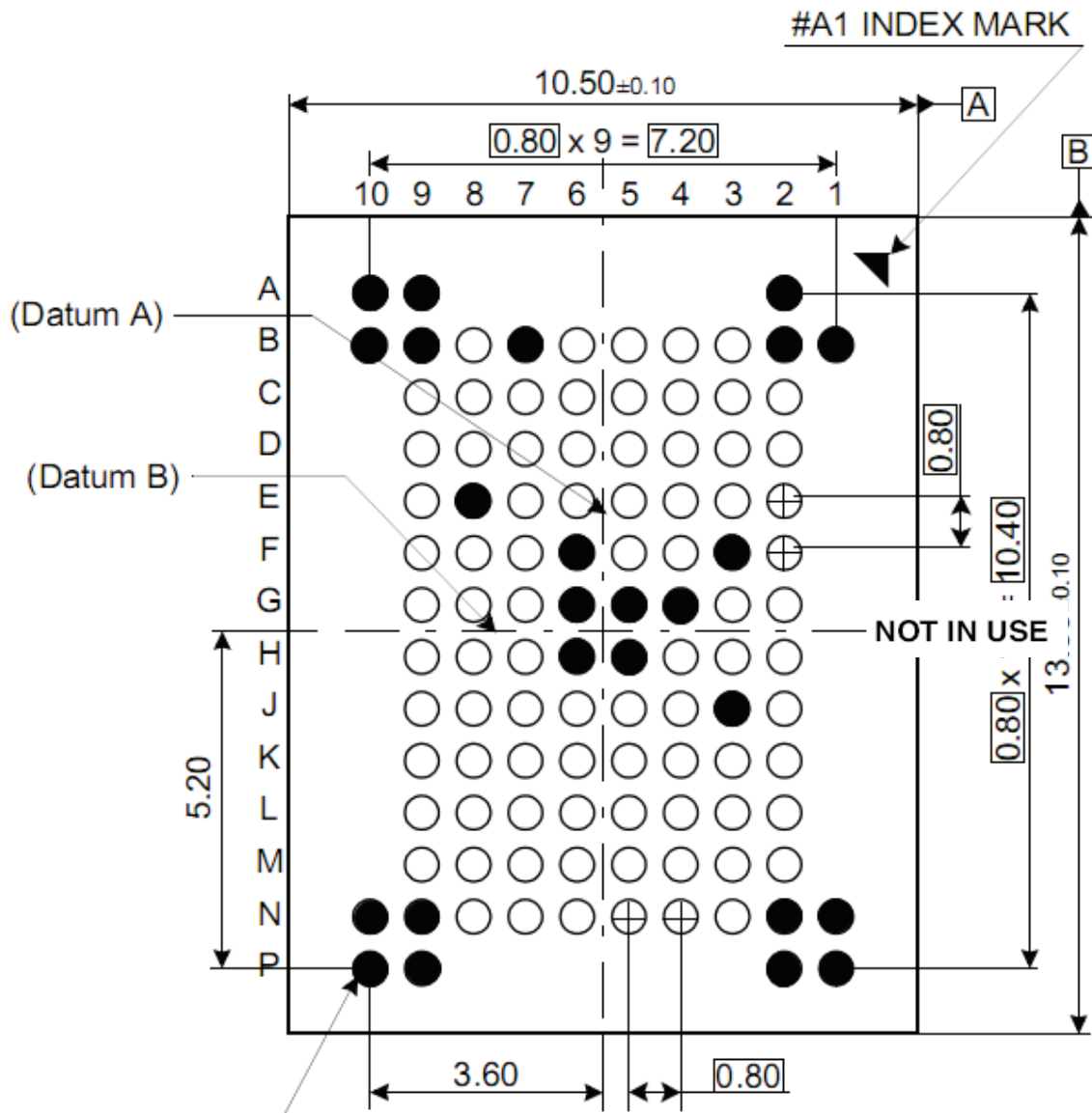
### MT6235 (Baseband Chipset) - U200 (bottom view)



- USE  
● NOT IN USE

## 8. BGA PIN MAP

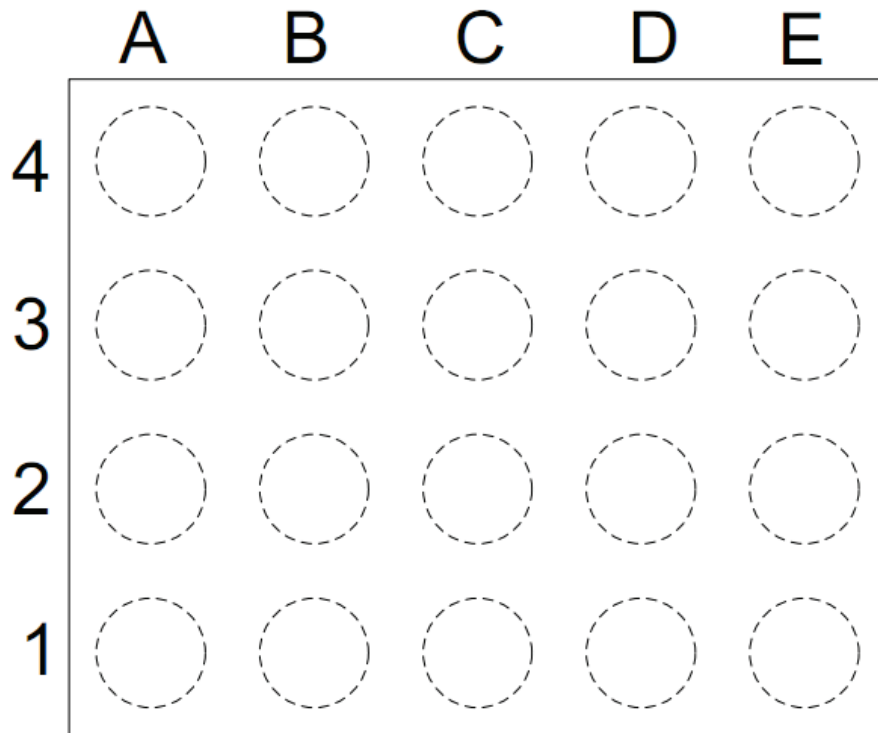
K511H12ACM-B075 (MCP,NAND) – U300 (EUSY03489002)



○ USE

● NOT IN USE

TS5USBA33402YZPR (MUIC)– U400 (EUSY0372001)

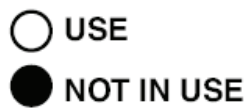
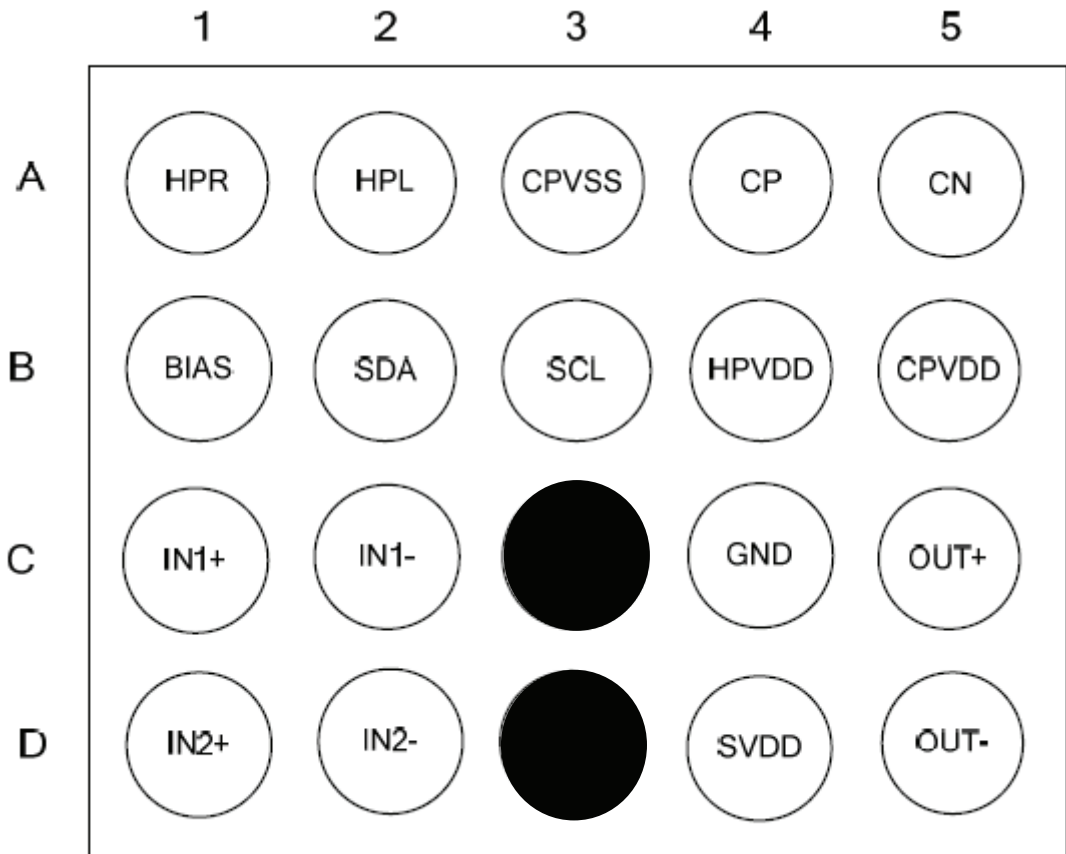


○ USE  
● NOT IN USE

# 8. BGA PIN MAP

## WM9093 (Ultra Low Power Audio Subsystem)– IC500 (EUSY0403901)

### 20-bump CSP package; Top View



### BlueCore BC7820 WLCSP 0.4MM pitch

#### Orientation from Top of Device

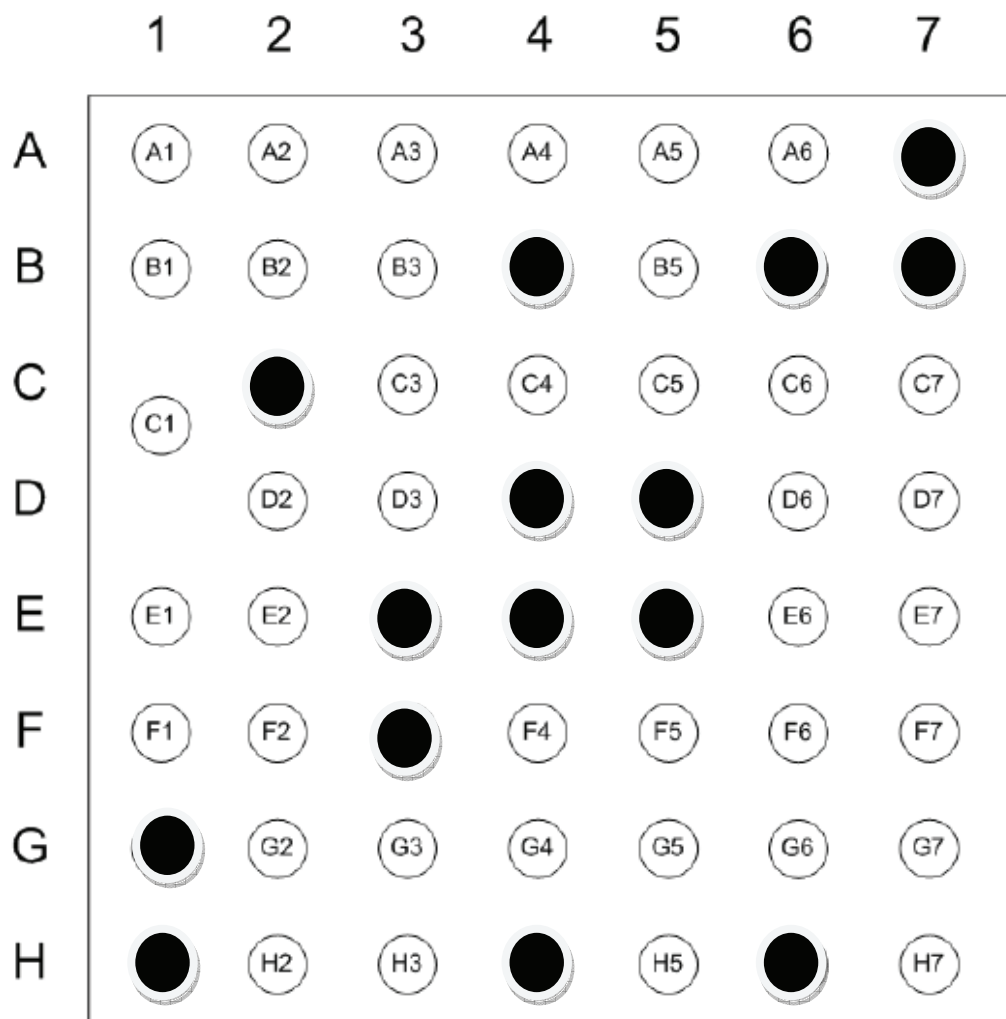
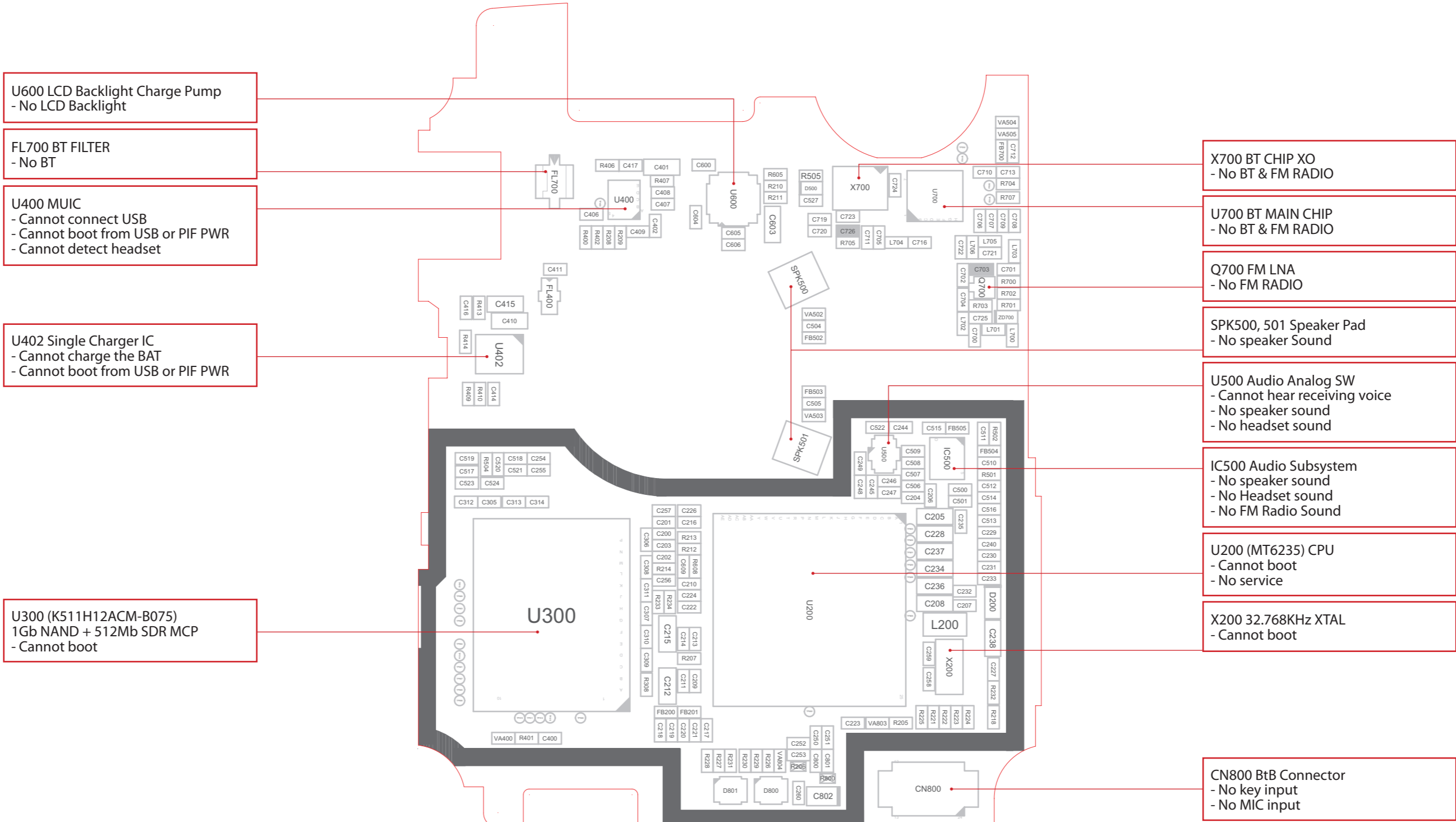


Figure 2.1: Device Pinout

○ USE  
● NOT IN USE

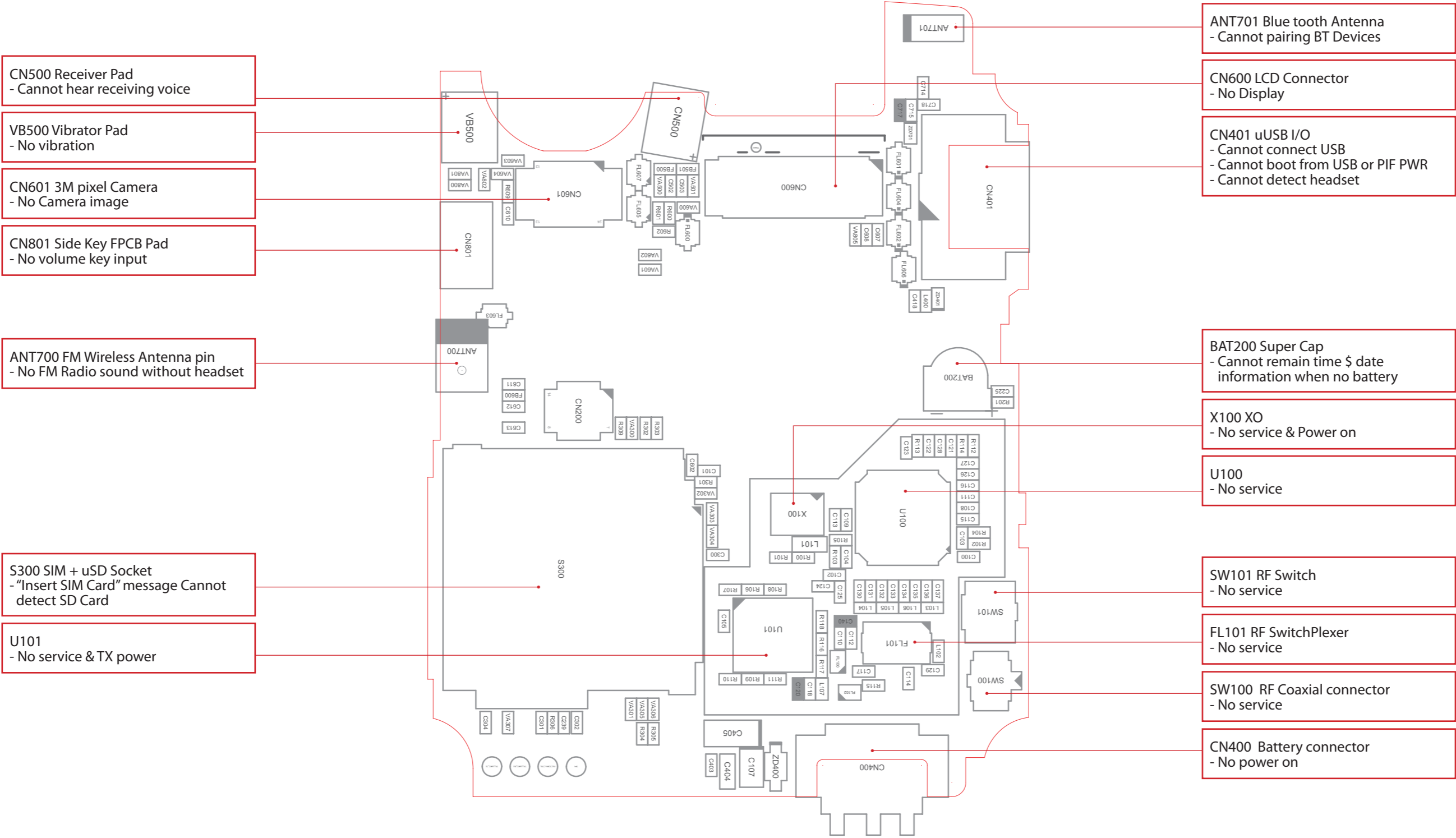


9. PCB LAYOUT



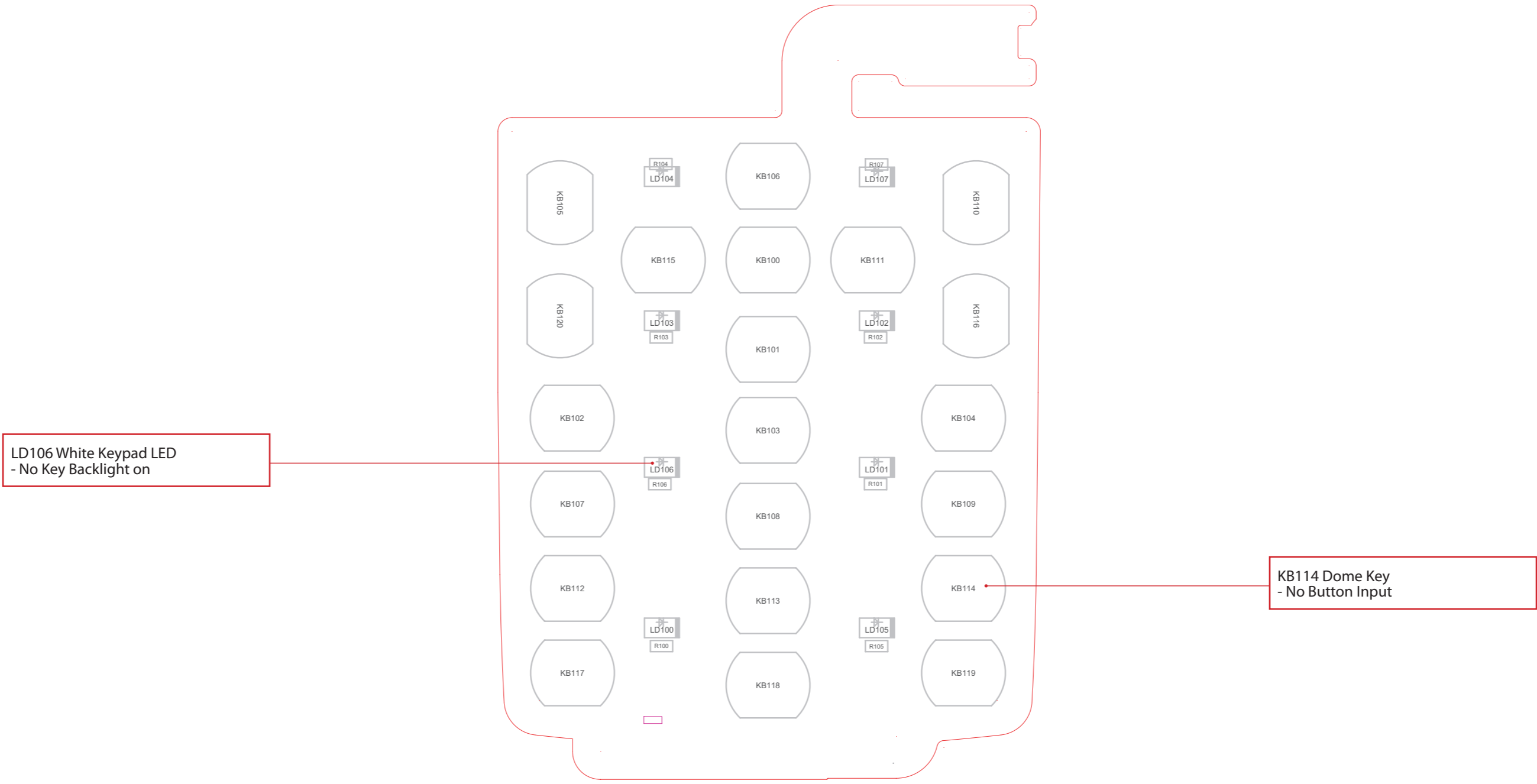
LG-S310\_MAIN\_SPFY0234701-1.0-TOP

# 9. PCB LAYOUT



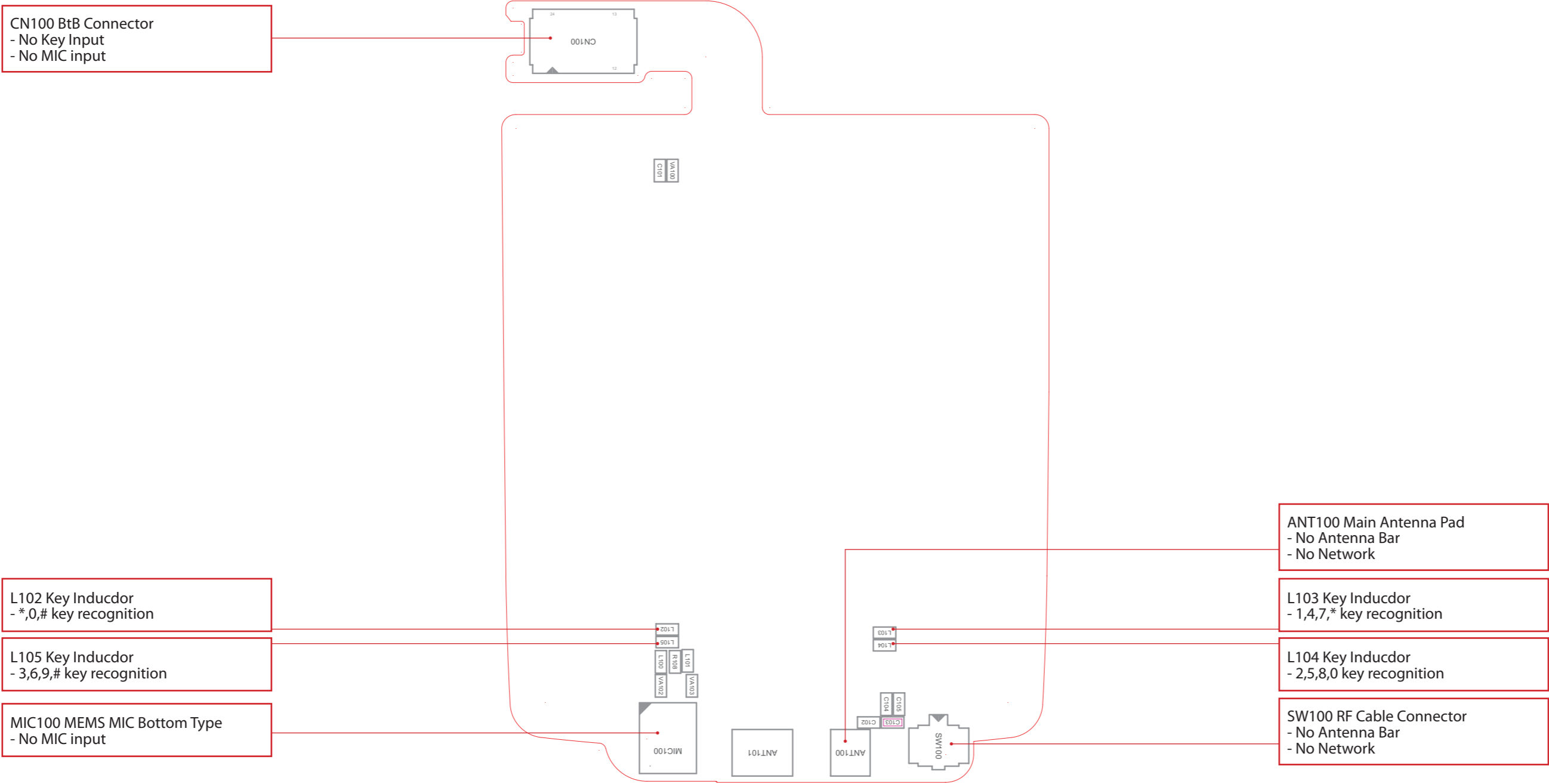
LG-S310\_MAIN\_SPFY0234701-1.0-BOT

9. PCB LAYOUT



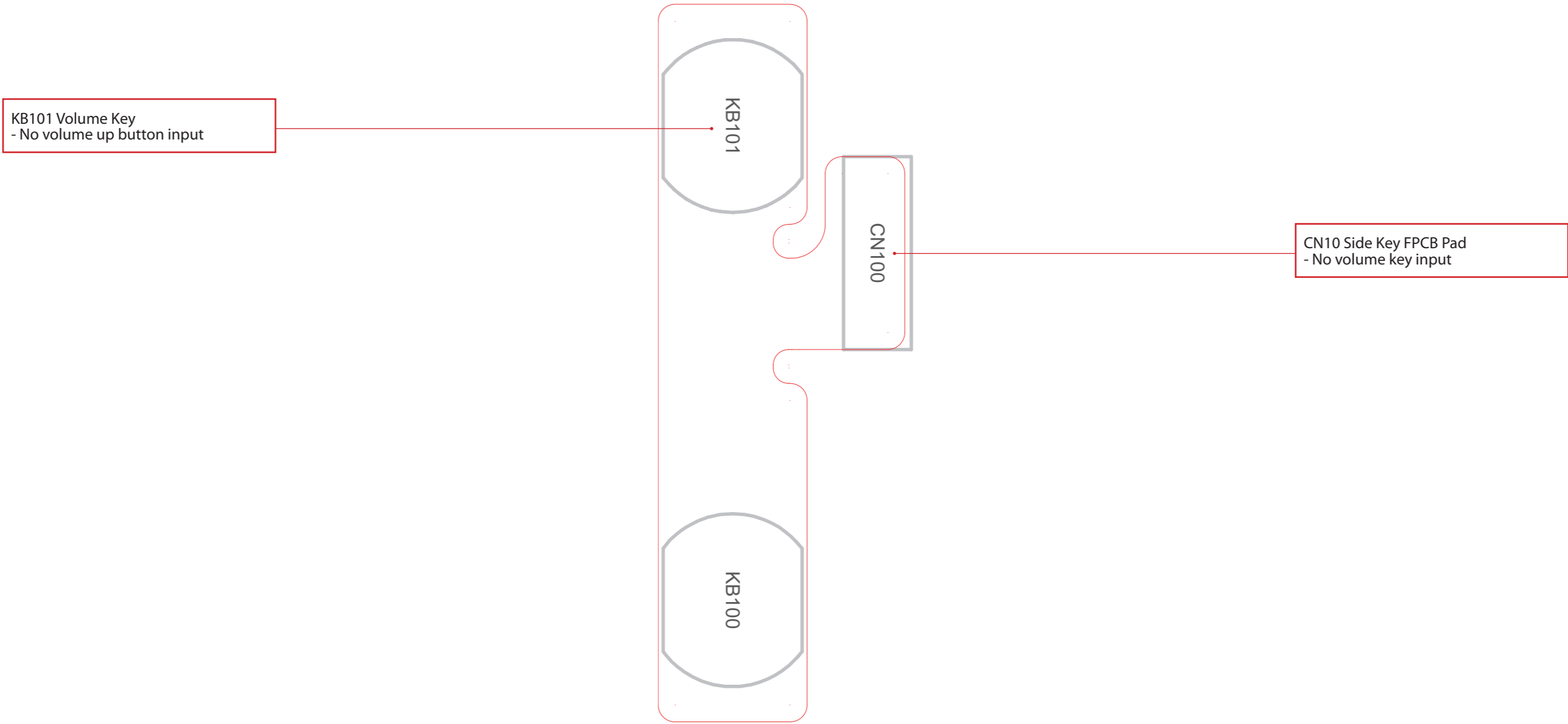
LG-S310\_F\_KEY\_SPCY0245001\_1.0\_TOP

9. PCB LAYOUT



LG-S310\_F\_KEY\_SPCY0245001\_1.0\_BOT

9. PCB LAYOUT



LG-S310\_F\_SK\_VOL\_SPKY0092901\_TOP



## 10. CALIBRATION

### 10.2 Usage of Tachyon for RF Calibration and Test

#### 10.2.1 Preparation work for setting RF cable loss

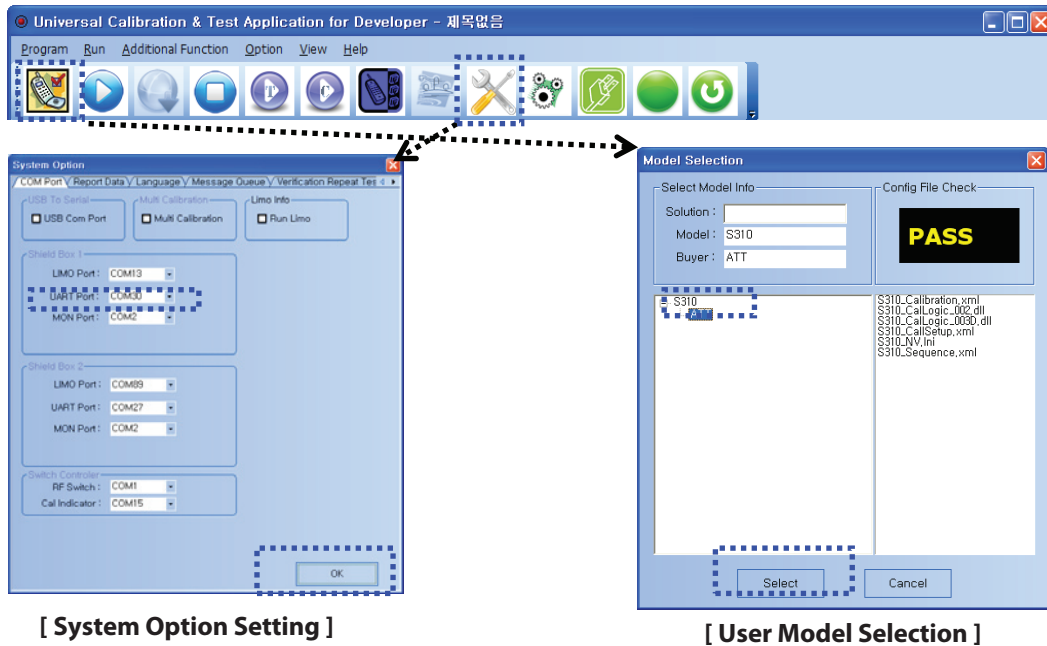


#### ● Procedure

1. Click "Hecaton.exe" in below directory to set RF cable loss on test equipment.  
✓ "C:\LGE\Tachyon\Utilities"
2. After selecting "Select File" button, select right RF cable loss file corresponding to RF cable that you use.

## 10. CALIBRATION

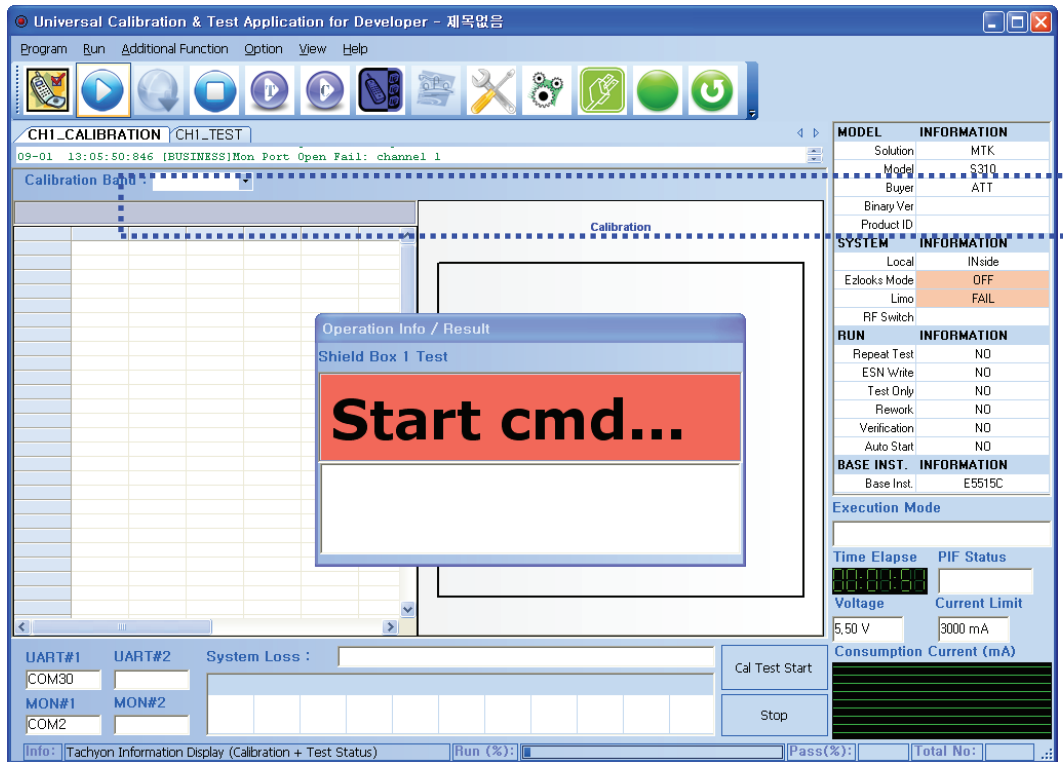
### 10.2.2 Basic Setting of Tachyon for RF Calibration & Test



#### ● Procedure

1. Click "Tachyon\_xxx.exe" in below directory to execute Tachyon program.  
"C:\LGE\Tachyon\"
2. Click "System Option Setting" icon in the menu to set COM port.
  - ✓ Unselect "UART Port" that can communicate with phone in the Shield Box 1 message.
  - ✓ Click the "OK" button.
3. Click "User Model Selection" icon in the menu to set model configuration.
  - ✓ Do double-click model/buyer name that you want to calibrate and test.
  - ✓ Click the "Select" button.

## 10.2.3 Log of RF Calibration and Test




## ● Contents


- ✓ On Running, log window is created in upper area.  
It displays logs of phone commands and measurements for RF calibration and test.
- ✓ The result files are saved in below directory
  - "C:\LGE\Tachyon\Report\CalData\" : the file of RF calibration result
  - "C:\LGE\Tachyon\Report\TestData\" : the file of RF test result

## 11. TEST MODE

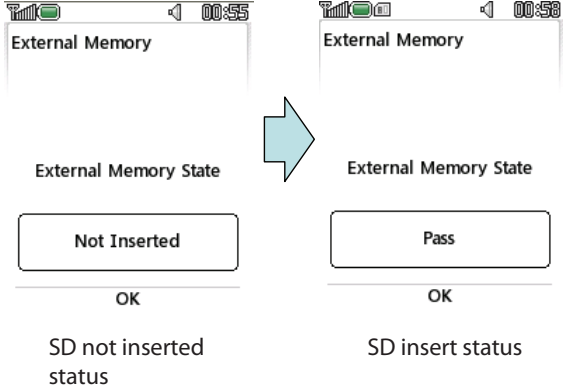
- 
- The diagram illustrates the navigation process. On the left, the 'Test Mode' screen is shown with a list of options: 1 Device Test, 2 ELT Mode, 3 SW Sanity Test, 4 Factory Reset, 5 Version, 6 Usage Info, and 7 FRC. A large blue arrow points from the 'Device Test' option to the right. On the right, the 'Device Test' screen is shown with a list of options: 1 All Auto Test, 2 Key Press, 3 Sound, 4 Vibrator, 5 External Memory, 6 Camera, and 7 Audio Loopback. Both screens have 'OK' and 'Back' buttons at the bottom.

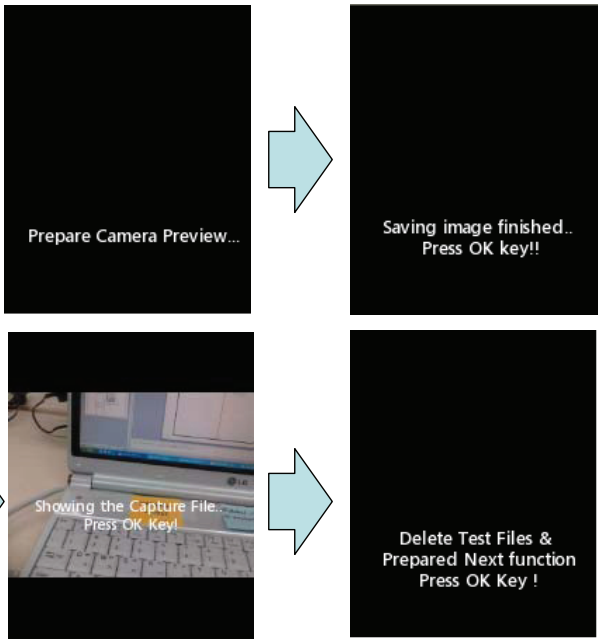
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Item	Order	Description
(2) Speaker Test	1. Sound On (Auto)            2. Test Finished, OK next step.	 <p>Ringtone (MP3) is played regularly</p> <p>Press "OK" button (Center Key) Move to next step</p>

Item	Order	Description
(3) Vibrator Test	1.Vibrator On (Auto)            2. Test Finished, OK next step.	 <p>Press "OK" button (Center Key) Move to next step</p>

## 11. TEST MODE

Item	Order	Description
(4) External Memory Test	<p>1.Insert SD or remove SD</p> <p>2. Test Finished, OK next step.</p>	 <p>Press "OK" button (Center Key) Move to next step`</p>

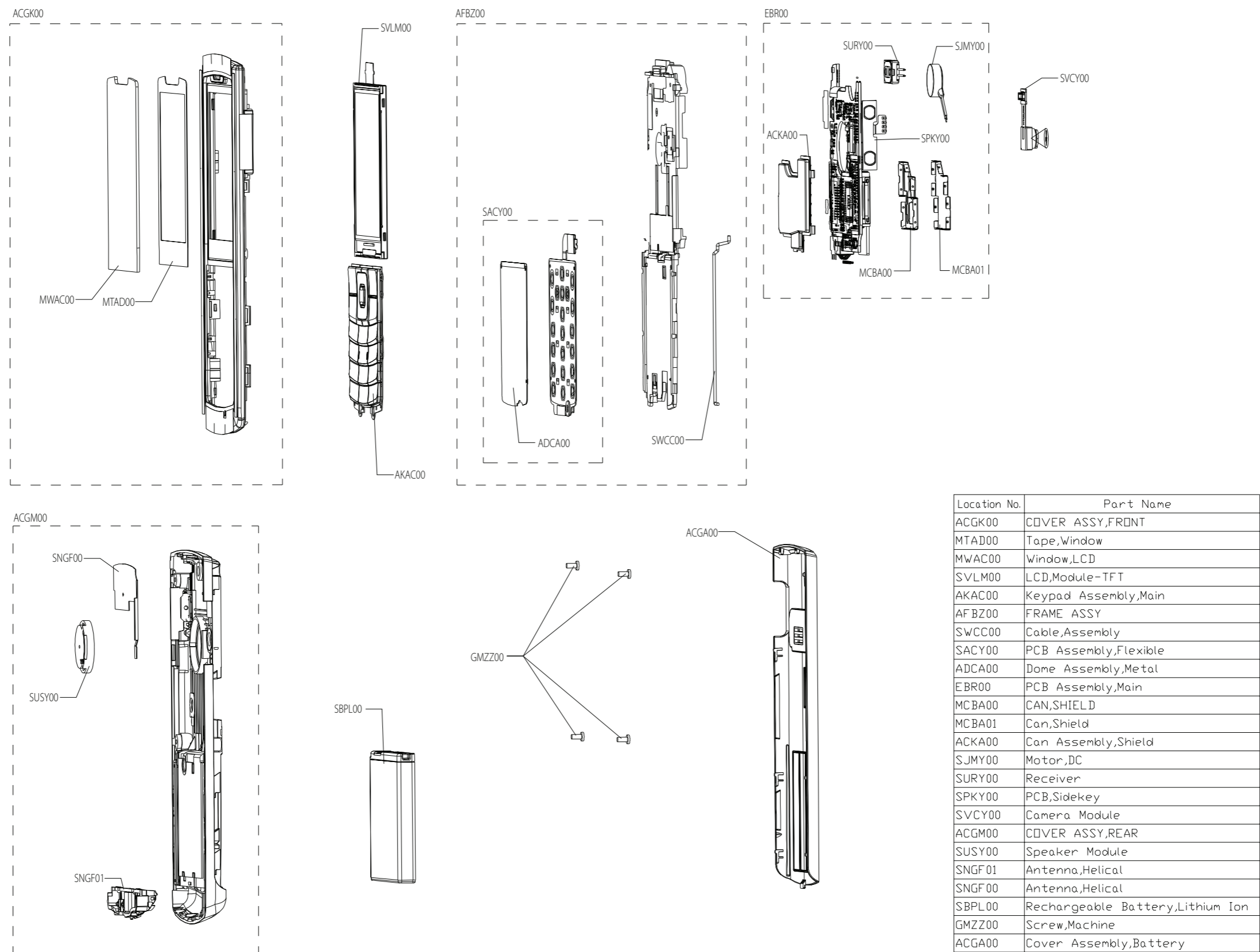
Item	Order	Description
(1) Key Press Test	<p>1.Key Test</p> <p>2. Test Finished, OK next step.</p>	<p><input type="checkbox"/> Key Test</p> 

Item	Order	Description
(6) Loopback Test	<p>1. Loopback On (Auto)</p> <p>2. Press "OK" Button. And TEST END</p>	 <p>Press "OK" button (Center Key) TEST END</p>



12. EXPLODED VIEW & REPLACEMENT PART LIST

12.1 EXPLODED VIEW





## 12. EXPLODED VIEW & REPLACEMENT PART LIST

### 12.2 Replacement Parts <Mechanic component>

Note: This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No.	Description	Part Number	Spec	Remark
1	AAD000000	Addition Assembly	AAD85591101 6	LGS310.ACHNSVSV:Silver-	
2	ACQ004100	Cover Assembly, Battery	ACGA0044001 2	LG-S310INDSVZZ:WithoutColorLG-S310INDSV	
3	MCJA00	Cover, Battery	MCJA0117301	COMPLEXLG-S310INDSVZZ:WithoutColorMOLD,PCLUPOYSC-1004A,	
3	MDAY00	Décor	MDAY0082301	COMPLEXLG-S310INDSVZZ:WithoutColorPRESS,STS,	
2	AFN053800	Manual Assembly, Operation	AFN75252701 4	LGS310.ACHNSVZZ:WithoutColor-	
3	MBM087200	Card, Warranty	MCDF0012801	COMPLEXKX197CTCBRZZ:WithoutColorPRINTING,(empty),,,,,	
3	MBM000000	Card	MCDZ0003201	COMPLEXLG-G252CHNSVZZ:WithoutColorPRINTING,(empty),	
3	MFL053800	Manual, Operation	MFL66981801	PRINTINGLGS310.ACHNSVZZ:WithoutColor-	
3	MFL053801	Manual, Operation	MMBB0123801	COMPLEXKF758CHNBKZZ:WithoutColor-	
1	AGQ000000	Phone Assembly	AGQ86294601	LGS310ACHNSVSV:Silver-	
2	ACQ100400	Cover Assembly, EMS	ACQ85320001 10	LGS310.ACHNSVSV:Silver-	
3	ACGK00	Cover Assembly, Front	ACGK0167601 10	LG-S310INDSVZZ:WithoutColor-	
4	MBFZ00	Bracket	MBFZ0052401	COMPLEXLG-S310INDSVZZ:WithoutColorBracketLCD	
4	MBJZ00	Button	MBJZ0039501	COMPLEXLG-S310INDSVZZ:WithoutColorVol.Key	
4	MCJK00	Cover, Front	MCJK0133501	COMPLEXLG-S310INDSVZZ:WithoutColorMOLD,PCLUPOYSC-1004A,	
5	MICE00	Insert, Nut	MICE0016905	COMPLEXMECH_COMMONZZ:WithoutColor-	
4	MDAY00	Decor	MDAY0082201	COMPLEXLG-S310INDSVZZ:WithoutColorDecoFront	
4	MPBG00	Damper, LCD	MPBG0114801	COMPLEXLG-S310INDSVZZ:WithoutColorCOMPLEX,(empty),,,,,	
4	MPBZ01	Damper	MPBZ0313101	COMPLEXLG-S310INDSVZZ:WithoutColorPadFilterReceiver	
4	MTAD00	Tape, Window	MTAD0131801	COMPLEXLG-S310INDSVZZ:WithoutColorLCD	
4	MTAZ01	Tape	MTAZ0334801	COMPLEXLG-S310INDSVZZ:WithoutColorDecoFront	
4	MTAZ00	Tape	MTAZ0334901	COMPLEXLG-S310INDSVZZ:WithoutColorKeyVolume	
4	MWAC00	Window, LCD	MWAC0149901	COMPLEXLG-S310INDSVZZ:WithoutColorCUTTING,PMMAMR200,	
3	ACGM00	Cover Assembly, Rear	ACGM0166701 21	LG-S310INDSVZZ:WithoutColor-	

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	LocationNo.	Description	PartNumber	Spec	Remark
4	MBFZ01	Bracket	MBFZ0052501	COMPLEXLG-S310INDSVZZ:WithoutColorBracketUSB	
4	MBFZ00	Bracket	MBFZ0052601	COMPLEXLG-S310INDSVZZ:WithoutColorBracketCable	
4	MCCC00	Cap,EarphoneJack	MCCC0073301	COMPLEXLG-S310INDSVZZ:WithoutColorMOLD,PCLUPOYSC-1004A,	
4	MCJN00	Cover,Rear	MCJN0125701	COMPLEXLG-S310INDSVZZ:WithoutColorMOLD,PCLUPOYSC-1004A,	
4	MCQ000002	Damper	MCQ66489201	COMPLEXLGS310.ACHNSVZZ:WithoutColor-	
4	MJN000004	Tape	MJN67668501	COMPLEXLGS310.AINDSVZZ:WithoutColorGasketUSB	
4	MLAB00	Label,AfterService	MLAB0001102	COMPLEXC2000CGRSVWA:WhiteC2000USASVDIA4.0PRI NTING,	
4	MPBJ00	Damper,Motor	MPBJ0077701	COMPLEXLG-S310INDSVZZ:WithoutColor-	
4	MPBN00	Damper,Speaker	MPBN0092701	COMPLEXLG-S310INDSVZZ:WithoutColorSpeaker	
4	MPBT02	Damper,Camera	MPBT0098001	COMPLEXLG-S310INDSVZZ:WithoutColor-	
4	MPBU00	Damper,Connector	MPBU0110201	COMPLEXLG-S310INDSVZZ:WithoutColor-	
4	MPBZ01	Damper	MPBZ0336701	COMPLEXLG-S310INDSVZZ:WithoutColorPadReceiver	
4	MPBZ00	Damper	MPBZ0336801	COMPLEXLG-S310INDSVZZ:WithoutColorPadReceiver2	
4	MTAD00	Tape,Window	MTAD0131901	COMPLEXLG-S310INDSVZZ:WithoutColorCamera	
4	MTAZ00	Tape	MTAZ0356601	COMPLEXLG-S310INDSVZZ:WithoutColorBracketUSB	
4	MTAZ01	Tape	MTAZ0356701	COMPLEXLG-S310INDSVZZ:WithoutColorBracketCable	
4	MTAZ03	Tape	MTAZ0376101	COMPLEXLG-S310INDSVZZ:WithoutColorStickerSDCard	
4	MWAE00	Window,Camera	MWAE0064101	COMPLEXLG-S310INDSVZZ:WithoutColorCUTTING,PMMAMR200,	
3	AFBZ00	FrameAssembly	AFBZ0021101	LG-S310INDSVZZ:WithoutColorAssy	
4	ADV000000	FrameAssembly	AFBZ0020801	LG-S310INDSVZZ:WithoutColorInsert	
4	MCCZ00	Cap	MCCZ0043401	COMPLEXLG-S310INDSVZZ:WithoutColorReceiver	
4	MCIZ00	Contact	MCIZ0006401	COMPLEXLG-S310INDSVZZ:WithoutColorContactFingerSpeaker	
4	MCQ000001	Damper	MCQ66489101	COMPLEXLGS310.ACHNSVZZ:WithoutColorPADBT	
4	MCQ049800	Damper,Motor	MCQ66489301	COMPLEXLGS310.ACHNSVZZ:WithoutColorPadMotor2	
4	MEV000000	Insulator	MEV63671901	COMPLEXLGS310.ACHNSVZZ:WithoutColorTapeInsulatorL CD	
4	MPBN01	Damper,Speaker	MPBN0092801	COMPLEXLG-S310INDSVZZ:WithoutColorPadSpeakerBack	
4	MPBN02	Damper,Speaker	MPBN0092901	COMPLEXLG-S310INDSVZZ:WithoutColorPadSpeakerBlock1	
4	MPBN00	Damper,Speaker	MPBN0093001	COMPLEXLG-S310INDSVZZ:WithoutColorPadSpeakerBlock2	
4	MPBZ00	Damper	MPBZ0358001	COMPLEXLG-S310INDSVZZ:WithoutColorPadFinger	

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	LocationNo.	Description	PartNumber	Spec	Remark
4	MTAK00	Tape,Camera	MTAK0041501	COMPLEXLG-S310INDSVZZ:WithoutColor-	
4	MTAZ01	Tape	MTAZ0335101	COMPLEXLG-S310INDSVZZ:WithoutColorPCB	
4	MTAZ03	Tape	MTAZ0356801	COMPLEXLG-S310INDSVZZ:WithoutColorCapReceiver	
4	MTAZ02	Tape	MTAZ0356901	COMPLEXLG-S310INDSVZZ:WithoutColorLCDBack	
4	MTAZ04	Tape	MTAZ0357001	COMPLEXLG-S310INDSVZZ:WithoutColorFrameCable	
4	MTAZ05	Tape	MTAZ0357101	COMPLEXLG-S310INDSVZZ:WithoutColorShieldCan	
6	ADB048600	DomeAssembly, Metal	ADCA0117601	LG-S310INDSVZZ:WithoutColor-	
3	AKAC00	KeypadAssembly, Main	AKAC0017901	LG-S310INDSVZZ:WithoutColor-	
5	ABM070300	CanAssembly,Shield	ACKA0037001	LG-S310INDSVZZ:WithoutColorFingerType	
6	MBK070300	Can,Shield	MCBA0081501	COMPLEXLG-S310INDSVZZ:WithoutColorPRESS,STS,	
6	MCQ000000	Damper	MPBZ0359501	COMPLEXLG-S310INDSVZZ:WithoutColorCOMPLEX,(empty),,,,,	
6	MCQ000001	Damper	MPBZ0359601	COMPLEXLG-S310INDSVZZ:WithoutColorCOMPLEX,(empty),,,,,	
5	MBK070300	Can,Shield	MCBA0081801	COMPLEXLG-S310INDSVZZ:WithoutColorPRESS,STS,	
5	MEZ000000	Label	MLAZ0038301	COMPLEXLG-VX6000ZZ:WithoutColorPIDLabel4ArrayPRINTING,	
6	SC100	Can,Shield	MCBA0081901	COMPLEXLG-S310INDSVZZ:WithoutColor-	
6	ANT700	Contact,Antenna	MCIA0019501	COMPLEXLG-VX9700VRZZ:WithoutColor-	
3	GMZZ00	Screw,Machine	GMZZ0017701	GMZZ0017701BH+1.4mM3mMMSWRNIPLTN-ASIABOLT	
3	MEZ049600	Label,Model	MLAK0019609	COMPLEXKG129CHMRDZZ:WithoutColor-	
3	MTAZ00	Tape	MTAZ0335201	COMPLEXLG-S310INDSVZZ:WithoutColor-	
1	AGF000000	PackageAssembly	APAY0146343	LGS310.ACHNSVZZ:WithoutColorLG-S310CHN(EU1/CHNUB/CHN-LB/SealUB1_MB2)	
2	MAY084000	Box,Unit	MAY64810003	BOXPaper12090564COLORLGS310.ACHNSVZZ:WithoutColorS310CHNUnitBox(EU1)	
2	MBAD00	Bag,Vinyl	MBAD0005204	COMPLEXLG-LX260SPRAGZZ:WithoutColor-	
2	MBEE00	Box,Master	MBEE0061001	COMPLEXGD510CZESVZZ:WithoutColor-	
2	MLAJ00	Label,MasterBox	MLAJ0004402	COMPLEXCG300CGRZZ:WithoutColorLABEL,MASTERBOX(forCGRTR2VER.mbox_label)	
2	MLAP00	Label,Unit	MLAP0001124	COMPLEXLG-W810BUMSVZZ:WithoutColorBOX,DW,PBOPBODW	
2	MLAQ00	Label,UnitBox	MLAQ0018018	COMPLEXKF690CHNSVZZ:WithoutColorPRINTING,ChinaGSM+CDMAUBLabel(90*40)	
2	MLAZ00	Label	MLAZ0050901	COMPLEXKU990GBRBKZZ:WithoutColor-	

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

### 12.2 Replacement Parts <Main component>

Note: This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No.	Description	Part Number	Spec	Remark
4	SNGF01	Antenna, Helical	SNGF0062801	S310-MAIN-EMWQUAD-2DB50OHM3E.M.WCO.,LTD.	
4	SNGF00	Antenna, Helical	SNGF0062901	S310-FMINTENNA-LAIRDSINGLE-5DB50OHM3LAIRDTECHNOLOGIESKOREA	
4	EAB010100	Speaker, Dual Mode	SUSY0027701	EMS1630BPB1PNA800mW8OHM90DB750HZ16mmx3.15S PRINGEM-TECH	
4	SACY00	PCBA Assembly, Flexible	SACY0121201 2	LG-S310INDSVFLEXIBLE1.0	
5	SACB00	PCBA Assembly, Flexible, Insert	SACB0067601	LG-S310INDSVFLEXIBLE1.0	
5	SACE00	PCBA Assembly, Flexible, SMT	SACE0109401 3	LG-S310INDSVFLEXIBLE1.0	
6	SACC00	PCBA Assembly, Flexible, SMT Bottom	SACC0082501 8	LG-S310INDSVFLEXIBLE1.0	
7	C104	Capacitor, Ceramic, Chip	ECZH0000802	C1005C0G1H010CT1pF0.25PF50VNP0-55TO+125C1005R/TP-TDKKOREACOOPERATION	
7	C101	Capacitor, Ceramic, Chip	ECZH0001215	C1005X5R1A105KT000F1uF10%10VX5R-55TO+85C1005R/TP-TDKKOREACOOPERATION	
7	L100, L101, L102, L103, L104, L105	Inductor, Multilayer, Chip	ELCH0001421	LL1005-FHL47NJ47NH5%0V200mA1.3OHM1.2GHZ10NONSHIELD 11.0X0.5X0.5MMR/TP TOKO, INC.	
7	CN100	Connector, BtoB	ENBY0045101	AXT52412424P0.4MMSTRAIGHTSOCKETSMR/TP1M-BJPANASONICELECTRONICPARTSCO.,LTD	
7	SW100	connector, RF	ENWY0003901	U.FL-R-SMT(10)U.FL-R-SMT(10),,SMD,dB,HIROSEKOREACO.,LTD	
7	C102, C103	Resistor, Chip	ERHZ0000401	MCR01MZSJ0000OHM5%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
7	R108, VA100, VA102, VA103	Varistor	SEVY0004101	ICVN0505X150FR5.6V0%360F1.0*0.5*0.55NONESMDR/TPINNOCHIPSTECHNOLOGY	
7	MIC100	Microphone, Condenser	SUMY0010610	SPM0410LR5H-QBSPM0410LR5H-QB,UNIT,42dB,4.72*3.76*1.25,memsTDMAImproveKNOWLESACOUSTICS	
6	SACD00	PCBA Assembly, Flexible, SMT Top	SACD0096301 2	LG-S310INDSVFLEXIBLE1.0	
7	LD100, LD101, LD102, LD103, LD104, LD105, LD106, LD107	LED, Chip	EDLH0005901	WHITE2.85~3.1520mA45~60mcd(X:Y=0.273/0.295~0.332/0.358)75mW1608R/TP2P-	

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	LocationNo.	Description	PartNumber	Spec	Remark
7	R100,R101, R102,R103, R104,R105, R106,R107	Resistor,Chip	ERHZ0000201	MCR01MZP5F1000100OHM1%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	SPCY	PCB,Flexible	SPCY0245001	SPCY0245001LG-S310INDSV,FLEXIBLE,E,POLYI,0.2mm,MULTI-3DAEDUCKGDSCO.,LTD	
4	EAD010000	Cable,Assembly	SWCC0007301	UFL-2LPVHF-04N1TC-A63.5LGUFL-2LPVHF-04N1TC-A63.5LG,63.5mm,LINEHIROSEKOREACO.,LTD	
3	EBR071900	PCBAssembly,Main	EBR72720501 2	LGS310.ACHNSVMAIN1.0	
4	EBR071500	PCBAssembly,Main,Insert	EBR72715701 6	LGS310.ACHNSVMAIN1.1	
5	RAA050100	Resin,PC	BRAH0001301	UF-1060	
5	EAU010000	Motor,DC	SJMY0007104	3V80mA0A12KRPM0RPM0SEC0GF.CM0OHM	
5	EAX010500	PCB,Sidekey	SPKY0092901	SPKY0092901LG-S310INDSV,SIDEKEY,C,POLYI,0.18mm,DOUBLED AEDUCKGDSCO.,LTD	
5	EAB010400	Receiver	SURY0010121	EMR1207SPB3ASSY,dB,ohm,1207*2.5T,10mm,WIRE,EM-TECH	
4	EBR071800	PCBAssembly,Main,SMT	EBR72715801 4	LGS310.ACHNSVMAIN1.0	
5	EBR071600	PCBAssembly,Main,SMTBottom	SAFC0153301 75	LG-S310MAIN1.0	
6	C130,C131, C136,C137, C418	Capacitor,Ceramic,Chip	ECCH0000110	MCH155A100D10pF0.25PF50VNP0-55TO+125C1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	C111,C134, C135,C301, C302	Capacitor,Ceramic,Chip	ECCH0000115	MCH155A220JK22pF5%50VNP0-55TO+125C1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	C100,C105, C126,C403, C502,C503	Capacitor,Ceramic,Chip	ECCH0000120	MCH155A390J39pF5%50VNP0-55TO+125C1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	C103,C104	Capacitor,Ceramic,Chip	ECCH0000127	MCH155A820J82pF5%50VNP0-55TO+125C1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	C121	Capacitor,Ceramic,Chip	ECCH0000133	C1005X7R1H221KT000F0.22nF10%50VX7R-55TO+125C1005R/TP-TDKKOREACOOPERATION	
6	C109	Capacitor,Ceramic,Chip	ECCH0000143	MCH155CN102KK1nF10%50VX7R-55TO+125C1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	C110	Capacitor,Ceramic,Chip	ECCH0000185	GRM1555C1H5R6C5.6pF0.25PF50VNP0-55TO+125C1005R/TP-MURATAMANUFACTURINGCO.,LTD.	
6	C132,C133	Capacitor,Ceramic,Chip	ECCH0000195	GRM1555C1H3R9C3.9pF0.25PF50VNP0-55TO+125C1005R/TP-MURATAMANUFACTURINGCO.,LTD.	
6	C611,C612, C613	Capacitor,Ceramic,Chip	ECCH0002001	C1005JB0J104KT000F0.1uF10%6.3VY5P-30TO+85C1005R/TP-TDKCORPORATION	

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	C239,C304,C607,C608	Capacitor,Ceramic,Chip	ECCH0004904	GRM155R60J105K1uF10%6.3VX5R-55TO+85C1005R/TP-MURATAMANUFACTURINGCO.,LTD.	
6	C610	Capacitor,Ceramic,Chip	ECCH0010501	GRM1555C1H7R5D7.5pFC0GTYPE(N0X7R)MURATAMANUFACTURINGCO.,LTD.	
6	C107	Capacitor,TA,Conformal	ECTH0001704	F981A226MSA22F20%10V2.2A-55TO+85C4OHM2.2X1.25X1.2MM-SMDR/TPNICHICONCORPORATION,EASTJAPANSALESO FFICE	
6	C405	Capacitor,TA,Conformal	ECTH0002703	TCTAL1A107M8R0.0001F20%10V50UA-55TO+125C0OHM3.2x1.6x1.1NONESMDR/TPROHMCO.,LTD.	
6	C102,C114,C117,C124,C125,C129,C714	Capacitor,Ceramic,Chip	ECZH0000813	C1005C0G1H101JT100pF5%50VNP0-55TO+125C1005R/TP-TDKKOREACOOOPERATION	
6	C108	Capacitor,Ceramic,Chip	ECZH0000841	C1005C0G1H560JT000F56pF5%50VNP0-55TO+125C1005R/TP-TDKKOREACOOOPERATION	
6	C118	Capacitor,Ceramic,Chip	ECZH0000846	C1005C0G1H8R2CT000F8.2pF0.25PF50VNP0-55TO+125C1005R/TP-TDKKOREACOOOPERATION	
6	C300,C602	Capacitor,Ceramic,Chip	ECZH0001215	C1005X5R1A105KT000F1uF10%10VX5R-55TO+85C1005R/TP-TDKKOREACOOOPERATION	
6	C122,C128	Capacitor,Ceramic,Chip	ECZH0001216	C1005X5R1A224KT000E220nF10%10VX5R-55TO+85C1005R/TP-TDKKOREACOOOPERATION	
6	C101,C115,C116,C123,C127,C225	Capacitor,Ceramic,Chip	ECZH0003103	GRM36X7R104K10PT100nF10%10VX7R-55TO+125C1005R/TP-MURATAMANUFACTURINGCO.,LTD.	
6	C404	Capacitor,Ceramic,Chip	ECZH0003503	GRM188R61E105K1uF10%25VX5R-55TO+85C1608R/TP-MURATAMANUFACTURINGCO.,LTD.	
6	ZD400	Diode,TVS	EDTY0008601	PSD05-LF5V613.5V42A500WSOD323R/TP2P1PROTEKDEVICESINC.	
6	ZD401,ZD701	Diode,TVS	EDTY0009401	VMNZ6.8CST2R5.5V010V0A200mWSC70R/TP6P5ROHM.	
6	L103,L106	Inductor,Multilayer,Chip	ELCH0001052	1005GC2T18NJLF18NH5%0V200mA0.65OHM1.6GHZ8NONSHIELD11.0X0.5X0.5MMR/TPPILKORELECTRONICSLTD.	
6	L104	Inductor,Multilayer,Chip	ELCH0001408	LL1005-FHL6N8J6.8NH5%0V400mA0.23OHM4.7GHZ9NONSHIELD11.0X0.5X0.5MMR/TPTOKO,INC.	
6	C715	Inductor,Multilayer,Chip	ELCH0003820	LQG15HS3N0S02D3NH0.3NH0V300mA0.17OHM6GHZ8NONSHIELD11.0X0.5X0.5MMR/TPMURATAMANUFACTURINGCO.,LTD.	
6	L105	Inductor,Multilayer,Chip	ELCH0003835	LQG15HS4N7S024.7NH0.3NH-300mA0.18OHM6KHZ8SHIELD11.0X0.5X0.55MMR/TPMURATAMANUFACTURINGCO.,LTD.	
6	C112	Inductor,Multilayer,Chip	ELCH0003839	LQG15HS22NJ02220NH5%-300mA0.42OHM1.9KHZ8SHIELD11.0X0.5X0.55MMR/TPMURATAMANUFACTURINGCO.,LTD.	
6	C718,L102	Inductor,Multilayer,Chip	ELCH0003842	LQG15HSR10J02100NH5%-150mA1.25OHM600HZ8SHIELD11.0X0.5X0.55MMR/TPMURATAMANUFACTURINGCO.,LTD.	

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	L400	Inductor,Multilayer, Chip	ELCH0010402	LK1005R27-TLK1005R27-T,270nH,M,1005,R/TP,CHIPTAIYOYUDENCO.,LTD	
6	L107	Inductor,Multilayer, Chip	ELCH0012507	LQW15AN18NG00D18NH2%0V370mA0.27OHM4.5GHZ25N ONSHIELD11.0X0.5X0.5MMR/TPMURATAMANUFACTURIN GCO.,LTD.	
6	CN601	Connector,BtoB	ENBY0034201	GB042-24S-H10-E300024P0.40MMSTRAIGHTSOCKETSMR/TP1M-LSMtronLtd.	
6	CN600	Connector,FFC/FPC/P IC	ENQY0014901	GF032-35S-E200035P0.30MMFPCSTRAIGHTBOTHSMR/TPLOCKING-LSMtronLtd.	
6	CN401	Connector,I/O	ENRY0010501	GU075-5P-SD-E15005P0.65MMANGLERECEPTACLEDIPR/TP-LSMtronLtd.	
6	S300	Socket,Card	ENSY0018601	49448-1611Micro-SD8PSTRAIGHTSMR/TPComboMOLEXJAPANCO.,LTD.	
6	SW100	connector,RF	ENWY0003901	U.FL-R-SMT(10)U.FL-R-SMT(10),,SMD,dB,HIROSEKOREACO.,LTD	
6	SW101	connector,RF	ENWY0007501	NMS-202NMS-202,SMD,dBNAMAELECTRONICSINC	
6	CN400	Connector, TerminalBlock	ENZY0027201	KQ03LP2-3R3P2.50MMSTRAIGHTSMR/TP-HIROSEKOREACO.,LTD	
6	R115	Resistor,Chip	ERHY0000105	MCR01MZP5F51R051OHM1%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	R301,R302, R303,R304, R305	Resistor,Chip	ERHY0000275	MCR01MZP5J56356KOHM5%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	R609	Resistor,Chip	ERHY0003301	MCR01MZP5J101100OHM5%1/16W1005R/TP-ROHM.	
6	R600,R601	Resistor,Chip	ERHZ0000203	MCR01MZP5F100210KOHM1%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	R602	Resistor,Chip	ERHZ0000204	MCR01MZP5F1003100KOHM1%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	R117,R118	Resistor,Chip	ERHZ0000219	MCR01MZP5F1500150OHM1%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	R100	Resistor,Chip	ERHZ0000244	MCR01MZP5F220222KOHM1%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	R306	Resistor,Chip	ERHZ0000286	MCR01MZP5F47014.7KOHM1%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	R113	Resistor,Chip	ERHZ0000404	MCR01MZP5J1021KOHM5%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	R112	Resistor,Chip	ERHZ0000405	MCR01MZP5J10310KOHM5%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	R309	Resistor,Chip	ERHZ0000406	MCR01MZP5J104100KOHM5%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	R106	Resistor,Chip	ERHZ0000410	MCR01MZP5J12012OHM5%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	R109	Resistor,Chip	ERHZ0000435	MCR01MZP5J20020OHM5%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	R102,R103, R104,R105	Resistor,Chip	ERHZ0000443	MCR01MZIP5J2222.2KOHM5%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	R114	Resistor,Chip	ERHZ0000449	MCR01MZIP5J24324KOHM5%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	R116	Resistor,Chip	ERHZ0000473	MCR01MZIP5J39039OHM5%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	R107,R108	Resistor,Chip	ERHZ0000484	MCR01MZIP5J471470OHM5%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	R201	Resistor,Chip	ERHZ0000499	MCR01MZIP5J5625.6KOHM5%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	R110,R111	Resistor,Chip	ERHZ0000531	MCR01MZIP5J271270OHM5%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	U100	IC,Tx/Rx	EUSY0280102	AD65461.8VTO3V,2.7VTO3V500MWLFCSPR/TP40P-MEDIATEKSINGAPOREPTE.LTD.	
6	X100	Crystal	EXXY0025201	DSX321G-26M-10PPM---SMDP/TPDAISHINKUCORPORATION.	
6	FL102	Coupler, RFBi-Directional	SCDY0004801	HHM2909C41.0*0.5*0.4SMDCOUPLER777M~787M,824M~925M,1710M~1785M,1850M~1910M0SMDR/TP20.4dB,19.4dB,13.5dB,12.8dB0.25,0.25,0.50,0.55321.0*0.5*0.4,SMD,824M~925M,4PINTDKCORPORATION	
6	FL100	Coupler,RFBi- Directional	SCDY0005001	HHM2920A1-16.5dB,0.28dB,31dB,1.0*0.5*0.4,SMD,1710M~1910M,4PIN,1810MHz,200MHz,SMD,R/TPTDKCORPORATION	
6	R101	Thermistor,NTC	SETY0006301	NCP15XH103J03RC10KOHM5%0V0A3.35KKSMDP/TP1005sizeMURATAMANUFACTURINGCO.,LTD.	
6	VA300, VA500, VA501	Varistor	SEVY0004101	ICVN0505X150FR5.6V0%360F1.0*0.5*0.55NONESMDR/TPINNOCHIPSTECHNOLOGY	
6	VA600, VA805	Varistor	SEVY0004301	ICVL0518100Y500FR18V0%10F1.0*0.5*0.55NONESMDR/TPINNOCHIPSTECHNOLOGY	
6	VA301, VA302, VA303, VA304, VA305, VA306, VA307	Varistor	SEVY0005101	ICVL0518050FR18V0%5F1.0*0.5*0.55NONESMDR/TPINNOCHIPSTECHNOLOGY	
6	VA601, VA602, VA603, VA604, VA800, VA801, VA802	Varistor	SEVY0005201	EVLC5S020505.5V0%50F1.0*0.5*0.6-SMDR/TPAMOTECHCO.,LTD.	
6	FL101	Filter,Separator	SFAY0013301	LMSP4DNA-8831.353535836.5,1880,1.5dB,1.6dB,27dB,25dB,ETC,4.5x2.5x1.2size,FEMMURATAMANUFACTURINGCO.,LTD.	
6	FB500, FB501	Filter,Bead	SFBH0008102	BLM15HD182SN118001.0x0.5x0.5MMSMDR/TP2PMURATAMANUFACTURINGCO.,LTD.	

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	FB600	Filter,Bead	SFBH0009601	HB-1T1005-221JT220ohm1.0*0.5*0.5SMDR/TP2PCERATECHCORPORATION	
6	FL603,FL605,FL607	Filter,EMI/Power	SFEY0013701	EVRC18S03Q015100RES/EMI330HZ15F0HSMDR/TPAMOTECHCO.,LTD.	
6	FL600,FL601,FL602,FL604,FL606	Filter,EMI/Power	SFEY0017602	ADF10S03Q100040FSMD,CRLC,50/35/50,4CH,10PIN,Filter,LGRAMOTECHCO.,LTD.	
6	U101	IC,PowerAmplifier	SMPY0019101	SKY77336SKY77336,dBm,%,A,dBc,dB,5x5,SMD,PolarEdgeforQCTSKYWORKSSOLUTIONSINC.	
6	BAT200	CapacitorAssembly	SMZY0023501	PAS311HR-VG13.8BackupCapacitor0.03F,ModuleAssembly,KOREATAIYOYUDEN.CO.,LTD.	
6	ANT701	Antenna,Chip	SNGF0009601	ALA321C3ALA321C3,3:1,0dBd,3:1,BTChipAntennaPb-FreeSMDAMOTECHCO.,LTD.	
5	EBR071700	PCBAsembly,Main,SMTTop	SAFD0151101 83	LG-S310MAIN1.0	
6	R206,R800	Part,Unclassified	99999999999	NOTASSEMBLE	
6	C259	Capacitor,Ceramic,Chip	ECCH0000112	MCH155C150J15pF5%50VNP0-55TO+125C1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	C258,C723	Capacitor,Ceramic,Chip	ECCH0000113	MCH155A180J18pF5%50VNP0-55TO+125C1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	C407,C408,C411,C417	Capacitor,Ceramic,Chip	ECCH0000115	MCH155A220JK22pF5%50VNP0-55TO+125C1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	C517,C523,C722	Capacitor,Ceramic,Chip	ECCH0000117	CL05C270JB5NNNC27pF5%50VNP0-55TO+125C1005R/TP0.5SAMSUNG ELECTRO-MECHANICS CO.,LTD.	
6	C244,C245,C246,C247,C252,C253,C254,C255,C260,C504,C505,C520,C800,C801	Capacitor,Ceramic,Chip	ECCH0000120	MCH155A390J39pF5%50VNP0-55TO+125C1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	C406	Capacitor,Ceramic,Chip	ECCH0000122	MCH155A470JK47pF5%50VNP0-55TO+125C1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	C524	Capacitor,Ceramic,Chip	ECCH0000129	MCH155A121JK120pF5%50VNP0-55TO+125C1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	C725	Capacitor,Ceramic,Chip	ECCH0000137	C1005X7R1H331KT000F0.33nF10%50VX7R-55TO+125C1005R/TP-TDKKOREACOOPERATION	
6	C721	Capacitor,Ceramic,Chip	ECCH0000143	MCH155CN102KK1nF10%50VX7R-55TO+125C1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	C409,C706	Capacitor,Ceramic,Chip	ECCH0000155	MCH153CN103KK10nF10%16VX7R-55TO+125C1005R/TP-ROHMSemiconductorKOREACORPORATION	

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	C709,C713	Capacitor,Ceramic, Chip	ECCH0000182	GRM155R61A104K0.1uF10%10VX5R-55TO+85C1005R/TP-MURATAMANUFACTURINGCO.,LTD.	
6	C200,C201, C203,C512, C513,C514, C515,C516, C519,C600, C705,C707, C708,C710	Capacitor,Ceramic, Chip	ECCH0000198	CL05A225MQ5NSNC2.2uF20%6.3VX5R-55TO+85C1005R/TP.SAMSUNGELECTRO-MECHANISCO.,LTD.	
6	C716	Capacitor,Ceramic, Chip	ECCH0001001	C1005C0G1H6R8CT000F6.8pF0.5PF50VNP0-55TO+125C1005R/TP-TDKKOREACOOPERATION	
6	C202,C219, C220,C223, C230,C231, C232,C233, C235,C248, C249,C604, C605,C606, C701,C719, C720	Capacitor,Ceramic, Chip	ECCH0004904	GRM155R60J105K1uF10%6.3VX5R-55TO+85C1005R/TP-MURATAMANUFACTURINGCO.,LTD.	
6	C603	Capacitor,Ceramic, Chip	ECCH0005603	GRM188R61A225K2.2uF10%10VX5R-55TO+85C1608R/TP-MURATAMANUFACTURINGCO.,LTD.	
6	C212,C215	Capacitor,Ceramic, Chip	ECCH0005604	GRM188R60J106M10000000pF,6.3V,M,X5R,TC,1608,R/TP,0.8mmMURATAMANUFACTURINGCO.,LTD.	
6	C228,C234, C236,C237, C238	ChipCeramicCapacitor (MLCC)	ECCH0006201	C1608X5R0J475KT000N4.7uF10%6.3VX5R-55TO+85C1608R/TP-TDKCORPORATION	
6	C205,C208	Capacitor,Ceramic, Chip	ECCH0007803	CL10A106MP8NNNC10uF20%10VX5R-55TO+85C1608R/TP0.8MMSAMSUNGELECTRO-MECHANISCO.,LTD.	
6	C500,C527, C712	Capacitor,Ceramic, Chip	ECCH0007804	CL05A225MP5NSNC2.2uF20%10VX5R-55TO+85C1005R/TP0.5MMSAMSUNGELECTRO-MECHANISCO.,LTD.	
6	C609	Capacitor,Ceramic, Chip	ECCH0010501	GRM1555C1H7R5D7.5pFC0GTYPE(NoX7R)MURATAMANUFACTURINGCO.,LTD.	
6	C802	Capacitor,TA,Conformal	ECTH0004807	TCM1A106M8R10F20%10V500mA-55TO+85C15OHM--SMDR/TPROHM.	
6	C724	Capacitor,Ceramic, Chip	ECZH0000816	C1005C0G1H120JT000F12pF5%50VNP0-55TO+125C1005R/TP-TDKKOREACOOPERATION	
6	C700	Capacitor,Ceramic, Chip	ECZH0000841	C1005C0G1H560JT000F56pF5%50VNP0-55TO+125C1005R/TP-TDKKOREACOOPERATION	
6	C702	Capacitor,Ceramic, Chip	ECZH0001122	C1005X7R1H681KT000F680pF10%50VX7R-55TO+125C1005R/TP-TDKKOREACOOPERATION	
6	C711	Capacitor,Ceramic, Chip	ECZH0001210	C1005Y5V1A474ZT000F470nF-20TO+80%10VY5V-30TO+85C1005R/TP-TDKKOREACOOPERATION	
6	C402,C414, C416,C506, C507,C508, C509	Capacitor,Ceramic, Chip	ECZH0001215	C1005X5R1A105KT000F1uF10%10VX5R-55TO+85C1005R/TP-TDKKOREACOOPERATION	
6	C704	Capacitor,Ceramic, Chip	ECZH0001217	GRM155R60J474K470nF10%6.3VX5R-25TO+70C1005BK-DUP-MURATAMANUFACTURINGCO.,LTD.	

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	C204,C206, C207,C209, C210,C211, C213,C214, C216,C217, C218,C221, C222,C224, C226,C227, C229,C240, C250,C251, C256,C257, C305,C306, C307,C308, C309,C310, C311,C312, C313,C314, C400,C501, C510,C511, C518,C521, C522	Capacitor,Ceramic, Chip	ECZH0003103	GRM36X7R104K10PT100nF10%10VX7R- 55TO+125C1005R/TP- MURATAMANUFACTURINGCO.,LTD.	
6	C415	Capacitor,Ceramic, Chip	ECZH0003503	GRM188R61E105K1uF10%25VX5R-55TO+85C1608R/TP- MURATAMANUFACTURINGCO.,LTD.	
6	C401,C410	Capacitor,Ceramic, Chip	ECZH0003504	GRM188R71E104K100nF10%25VX7R- 55TO+125C1608R/TP- MURATAMANUFACTURINGCO.,LTD.	
6	D200	Diode,Switching	EDSY0011901	SDB310Q340mV30V200mA1A0SEC150mWEMD2R/TP2P1 AUKCORP	
6	D500	Diode,Switching	EDSY0018101	RB521CS- 30GJT2R350mV30V100mA0A0SEC200mWVMN2R/TP2P1R OHM.	
6	D800,D801	Diode,TVS	EDTY0007601	UCLAMP0505A5V612V7A100WSC89R/TP6P5SEMTECHCO RPORATION	
6	C703, ZD700	Diode,TVS	EDTY0009401	VMNZ6.8CST2R5.5V010V0A200mWSC70R/TP6P5ROHM.	
6	L702	Inductor,Multilayer, Chip	ELCH0001425	LL1005- FHL82NJ82NH5%0V200mA1.9OHM970MHZ10NONSHIELD 11.0X0.5X0.5MMR/TP TOKO,INC.	
6	L705	Inductor,Multilayer, Chip	ELCH0001430	LL1005- FHLR10J100NH5%0V200mA2.2OHM870MHZ10NONSHIEL D11.0X0.5X0.5MMR/TP TOKO,INC.	
6	L701	Inductor,Multilayer, Chip	ELCH0003843	LQG15HSR12J02120NH5%- 150mA1.3OHM600HZ8SHIELD11.0X0.5X0.55MMR/TPMUR ATAMANUFACTURINGCO.,LTD.	
6	L704	Inductor,Multilayer, Chip	ELCH0003847	LQG15HS1N8S02LQG15HS1N8S02,1.8nH,S,1005,R/TP,chi pcoilMURATAMANUFACTURINGCO.,LTD.	
6	L700	Inductor,Multilayer, Chip	ELCH0003848	LQG15HSR22J02D220NH5%0V0A3.77OHM450MHZ8SHIE LD01.0X0.5X0.5MMR/TPMURATAMANUFACTURINGCO.,L TD.	
6	L706	Inductor,Multilayer, Chip	ELCH0004727	1005GC2TR10J00100NH5%0V100mA2.3OHM600MHZ8NO NSHIELD11.0X0.5X0.5MMR/TPPILKORELECTRONICSLTD.	
6	L703	Inductor,Multilayer, Chip	ELCH0005004	HK100522NJ22NH5%0V8A2.8GOHM420mHZ300mNONSHI ELD11.0X0.5X0.5MMR/TPTAIYOYUDENCO.,LTD	

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	L200	Inductor,WireWound,chip	ELCP0012901	APILO5G4R7MT4.7uH,M,2.0*1.25*1.0,R/TP,0.0000047,20%,0.25A,0.3OHM,SHIELD,2X1.25X1MM,NONE,R/TP,Inductor,WireWound,ChipAMOTECHCO.,LTD.	
6	CN800	Connector,BtoB	ENBY0045001	AXT62412424P0.4MMSTRAIGHTHEADERSMDR/TP1M-BJPANASONICELECTRONICPARTSCO.,LTD	
6	Q700	TR,Bipolar	EQBN0019201	KTC3770VVSM,0.1W,R/TP,1.2*1.2*0.5Vcbo=20,Vceo=12,Vebo=2V,Ic=100mAKECCORPORATION	
6	R308	Resistor,Chip	ERHY0000147	MCR01MZIP5F560256KOHM1%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	R413	Resistor,Chip	ERHY0000185	MCR01MZIP5F8200820OHM1%1/16W1005R/TP-ROHM.	
6	R208,R209, R210,R211, R233,R234	Resistor,Chip	ERHY0000254	MCR01MZIP5J4724.7KOHM5%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	R608	Resistor,Chip	ERHY0003301	MCR01MZIP5J101100OHM5%1/16W1005R/TP-ROHM.	
6	R214	Resistor,Chip	ERHZ0000252	MCR01MZIP5F2403240KOHM1%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	R414	Resistor,Chip	ERHZ0000264	MCR01MZIP5F30013000ohm,1/16W,F,1005,R/TPROHM SemiconductorKOREACORPORATION	
6	R705	Resistor,Chip	ERHZ0000285	MCR01MZIP5F4700470OHM1%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	R207	Resistor,Chip	ERHZ0000294	MCR01MZIP5F51015.1KOHM1%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	R505	Resistor,Chip	ERHZ0000402	MCR01MZIP5J10010OHM5%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	R205,R218, R401	Resistor,Chip	ERHZ0000404	MCR01MZIP5J1021KOHM5%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	R232,R407, R409,R410, R605,R704, R707	Resistor,Chip	ERHZ0000406	MCR01MZIP5J104100KOHM5%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	R501,R502	Resistor,Chip	ERHZ0000435	MCR01MZIP5J20020OHM5%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	R212,R213, R402,R406, R504	Resistor,Chip	ERHZ0000443	MCR01MZIP5J2222.2KOHM5%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	R701	Resistor,Chip	ERHZ0000449	MCR01MZIP5J24324KOHM5%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	R703	Resistor,Chip	ERHZ0000485	MCR01MZIP5J4724.7KOHM5%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	R400	Resistor,Chip	ERHZ0000486	MCR01MZIP5J47347KOHM5%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	R221,R222, R223,R224, R225,R226, R227,R228, R229,R230, R231	Resistor,Chip	ERHZ0000505	MCR01MZIP5J681680OHM5%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	R702	Resistor,Chip	ERHZ0000531	MCR01MZP5J271270OHM5%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	R700	Resistor,Chip	ERHZ0003801	MCR01MZP5J5R15.1OHM5%1/16W1005R/TP-ROHMSemiconductorKOREACORPORATION	
6	U600	IC,ChargePump	EUSY0344402	RT9367CQFN,20,R/TP,4CH,2LDO,3X3,IC,SubPMICIC,SubPMICIRICHTEKTECHNOLOGYCORP.	
6	U500	IC,AnalogSwitch	EUSY0347001	DG2735DN-T1-E4MiniQFN-10L,10PIN,R/TP,1.8X1.4X0.55,0.6DualSPDTAnalogSwitch,,IC,AnalogSwitchVISHAYINTERTECHNOLOGYASIAPTELTD	
6	U400	IC,AnalogMultiplexer	EUSY0372001	TS5USBA33402YZPRTS5USBA33402.WCSP.20,R/TP,MUICTEXASINSTRUMENTSKOREALTD,HONGKONGBRANCH.	
6	U402	IC,Charger	EUSY0388501	BQ25040BQ25040,DFN,10,R/TP,CalTestModeSingleChargerICforMicroUSBTEXASINSTRUMENTSKOREALTD,HONGKONGBRANCH.	
6	U300	IC,MCP,NAND	EUSY0389002	K511H12ACM-B075FBGA,107,ETC,1.8V1G(LB/64Mx16)NAND+512M(8Mx4x16)SDRAM,,IC,MCP,SAMSUNG ELECTRONIC CO.,LTD	
6	U200	IC,DigitalBasebandProcessor,GSM	EUSY0394301	MT62350VTO0V0WBGAR/TP362P-MEDIATEKINC.	
6	IC500	IC,AudioSubSystem	EUSY0403901	WM9093ECS/R1.71~5.5V0WWLCSPPR/TP20P-WOLFSONMICROELECTRONICSPLC	
6	U700	IC,Bluetooth	EUSY0411201	BC7820A12-ICKC-R2.3VTO5.5V108.9mWWLCSPPR/TP55P-CSR	
6	X200	Crystal	EXXY0018701	FC-135(12.5PF,+20PPM)32.768KHZ20PPM12.5PF32*15SMDR/TPSEIKOEPS ONCORP	
6	X700	Crystal	EXXY0025201	DSX321G-26M-10PPM---SMDP/TPDAISHINKUCORPORATION.	
6	VA502,VA503,VA504,VA505	Varistor	SEVY0004101	ICVN0505X150FR5.6V0%360F1.0*0.5*0.55NONESMDR/TPINNOCHIPSTECHNOLOGY	
6	VA400,VA803,VA804	Varistor	SEVY0005201	EVLC5S020505.5V0%50F1.0*0.5*0.6-SMDR/TPAMOTECHCO.,LTD.	
6	FB700	Filter,Bead	SFBH0000912	HB-1M1005-102JT1000ohm1.0*0.5*0.5SMDR/TP2PCERATECHCORPORATION	
6	FB200,FB201	Filter,Bead	SFBH0008101	BLM15AG601SN1600ohm1.0x0.5x0.55SMDR/TP2PMURATAMANUFACTURINGCO.,LTD.	
6	FB504,FB505	Filter,Bead	SFBH0008106	BLM15HG102SN1600at100MHz,1000at1GHz1.0x0.5x0.5SMDR/TP2PMURATAMANUFACTURINGCO.,LTD.	
6	FB502,FB503	Filter,Bead	SFBH0008107	BLM15BD221SN1D220at100MHz1.0x0.5x0.5SMDR/TP2PMURATAMANUFACTURINGCO.,LTD.	
6	FL700	Filter,Dielectric	SFDY0003001	DEA202450BT-1275A1DEA202450BT-1275A1,2450MHz,2.0*1.25*1.05,SMD,2400M~2500M,IL1.6,4pin,U-U,50-50,BTBPFTDKCORPORATION	

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	FL400	Filter,EMI/Power	SFEY0015301	NFM18PC104R1C3ESD/EMI0HZ0.1uF0HSMDR/TPMURAT AMANUFACTURINGCO.,LTD.	
6	SPFY	PCB,Main	SPFY0234701	SPFY0234701FR-4StaggeredviaSTAGGERED-100.8LG- S310INDSV,MAIN,D,FR-40.8mm,STAGGERED- 10UNITECHPRINTEDCIRCUITBOARDCORP.	
3	SVCY00	CameraModule	SVCY0024501	LM36SSFFHSIS- LM36SSFF3MFF,Samsung(1/5"),7x7x4.1,FPCB,90degreeHA NSUNGELCOMTECCO.,LTD.	
3	EAJ020200	LCD,Module-TFT	SVLM0036102	GPM1031A0Main,2.2",176*220,39.848*52.95*1.9t,262K,TFT, TM,ILI9225B,GIANTPLUSTECHNOLOGYCO.,LTD.	

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

### 12.3 Accessory

Note: This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	LocationNo.	Description	PartNumber	Spec	Remark
2	EAC020100	Rechargeable Battery, Lithium Ion	SBPL0100002	LGIP-550N-CN-TOPRISMATIC3.7V900mAh180mAh36X50X5.339.5X41.6X5.75BLACKFrameType-TOCADDONGHWA	
2	EBX000000	Accessory, Data Cable	SGDY0018701	LG0033, 1.2M, MicroUSB5PIN, BLACK, ID180K, ningbo broadtel ecommunication co., ltd	
2	EAY060000	Adapters	SSAD0036201	STA-U12CD90Vac~264Vac5.1V700mA5060CCCNONENONE-DONGDOELECTRONICSCO., LTD	
2	EAY060000	Adapters	*S*SSAD0036202	90Vac~264Vac5.1V700mA5060CCCNONENONE-	